ORDER NO. VRD-8403-507

Service Manual

Portable Video Cassette Recorder

Panasonic Omnivision VHS

PV-8000

PV-8000 Portable Deck

Vol. 1	Vol. 2	Vol. 3	Vol. 4	Vol. 5
Summary	*Mechanical Adjustment Procedures* *Electrical Adjustment Procedures*	*Block Diagrams*	*Schematic Diagrams* *Printed Circuit Board Diagrams*	*Exploded Views* *Replacement Parts List*

VHS

Panasonic®

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MC-Service

ORDER NO. VRD-8403-507

Service Manual

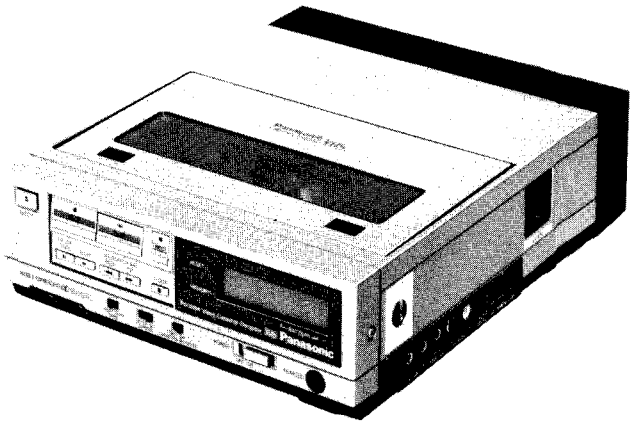
Video Cassette Recorder

Vol. 1

Panasonic Omnivision VHS

PV-8000

Summary



SPECIFICATIONS

Power Source:	12V DC Battery PV-BP80 Prog. Tuner Unit PV-A820 PV-A850 PV-A860 Plug-in AC Adaptor PV-A118
Power Consumption:	Approx. 10 watts (16W with Camera)
Television System:	EIA Standard (525 lines, 60 fields) NTSC color signal
Video Recording System:	4 rotary heads, helical scanning system Luminance: FM azimuth recording Color signal: Converted subcarrier phase shift recording
Audio Track:	2 track
Tape Format:	Tape width 1/2″ (12.7mm), high density tape
Tape Speed:	SP mode: 1-5/16 i.p.s. (33.35mm/s) LP mode: 21/32 i.p.s. (16.67mm/s) SLP mode: 7/16 i.p.s. (11.12mm/s)
Record/Playback Time:	8 HRS. with 160 min. type tape used in SLP mode
FF/REW Time:	Less than 6 min. with 120 min. type tape
Heads:	Video: 4 rotary heads Audio: 2 stationary heads Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing
Input Level:	Video: VIDEO IN Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack (Left, Right) −70dB, 4kΩ unbalanced
Output Level:	Video: VIDEO OUT Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack (RCA type) −9dB, 600Ω unbalanced RF Modulated: Ch3/Ch4 switchable 72dBμ, (Open Voltage) 75Ω unbalanced
Video Horizontal Resolution:	Color: more than 230 lines B/W: more than 230 lines
Audio Frequency Response: (10dB down)	SP mode: 100Hz ~ 8kHz LP mode: 100Hz ~ 6kHz SLP mode: 150Hz ~ 5kHz
Signal-to-Noise Ratio:	Video: SP mode: better than 41dB LP mode: better than 41dB SLP mode: better than 41dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB LP mode: better than 40dB SLP mode: better than 40dB
Operation Temperature:	32°F—104°F (0°C—40°C)
Operating Humidity:	10%—75%
Weight:	5.7 lbs. (2.6kg)
Dimensions:	8-7/16″(W) × 2-3/4″(D) × 10-3/8″(H) (215mm × 69.5mm × 263mm)

Weight and dimensions shown are approximate.

Specifications are subject to change without notice

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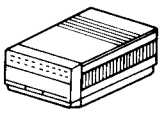
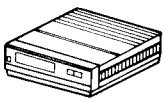
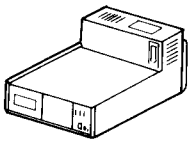
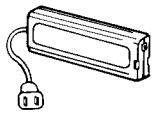
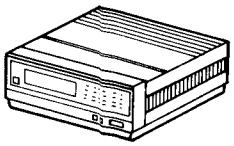
PORTABLE CLASSIFICATION

AS YOU SEE ON THE COMBINATION CHART, THERE ARE SEVERAL COMBINATED MODELS FOR 1984 PORTABLE VCR LINE.
FOR PREVENTION OF DUPLICATED INFORMATION, SERVICE MANUALS ARE INDIVIDUALLY ARRANGED, ONLY SUCH AS DECK PORTION, TUNER AND PLUG-IN AC ADAPTOR.

IN CASE OF THE SERVICE FOR COMBINATED MODELS, PLEASE REFER TO APPROPRIATE MANUALS WHICH ARE SHADED ON THE CHART.
AS EXCEPTIONAL ITEMS, PACKAGE INFORMATION FOR THE COMBINATED MODELS IS INCLUDED IN THE MANUALS OF THE TUNER AND THE PLUG-IN AC ADAPTOR.

PLUG-IN AC ADAPTOR/ TUNER / DECK	PV-A580	PV-A850	PV-A860	PV-A118	PV-A820
					
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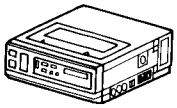
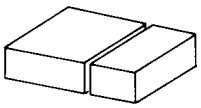
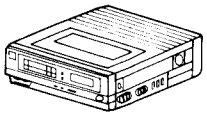
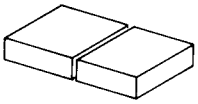
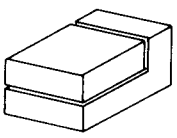
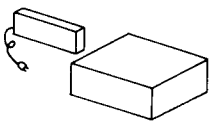
PV-5800D	PV-5800				
	COMBINATED MODEL 				
VRD-8404-519					
PV-8000		PV-8500	PV-8600	PV-8110	
		COMBINATED MODEL 	COMBINATED MODEL 	COMBINATED MODEL 	
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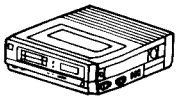
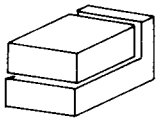
PV-9000			PV-9600		
			COMBINATED MODEL 		
VRD-8406-523					

INTRODUCTION

This Service Manual contains information which will allow the service technician to understand and service the Panasonic Portable VHS Video Recorder Model PV-8000.
Some of the many special features include recording time up to 8 hours, portability, soft touch function controls, convenient 4 power source system (battery pack, the tuner unit, a car battery cary, plug-in AC adaptor), minimal picture interference during add-on recording, multimotion playback, an one touch connection method to the tuner and it is light weight and very compact.
These beatures in addition to the basic VHS format make the PV-8000 an ideal unit for your education, recreation and entertainment.

Just slightly ahead of our time...Panasonic

CONTENTS

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ELECTROSTATICALLY SENSITIVE (ES) DEVICES 1-3
PORTABLE SYSTEM/FEATURES 1-4
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SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shileds are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ. When the exposed metal does not have a return path to the chassis, the reading must be ∞.

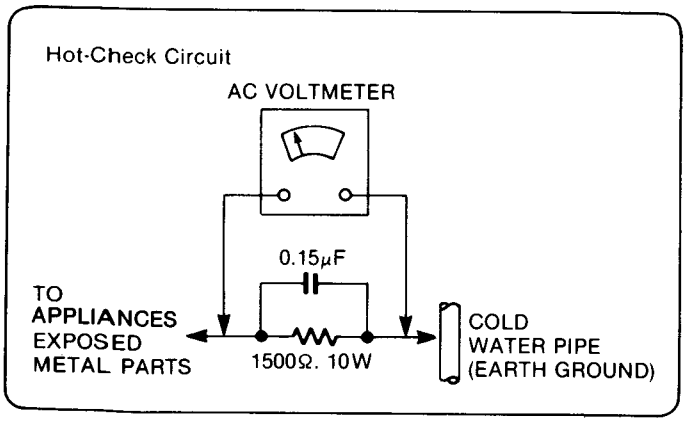


Figure 1

LEAKAGE CURRENT HOT CHECK (See figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kΩ, 10 watts resistor, in parallel with a 0.15μF capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.

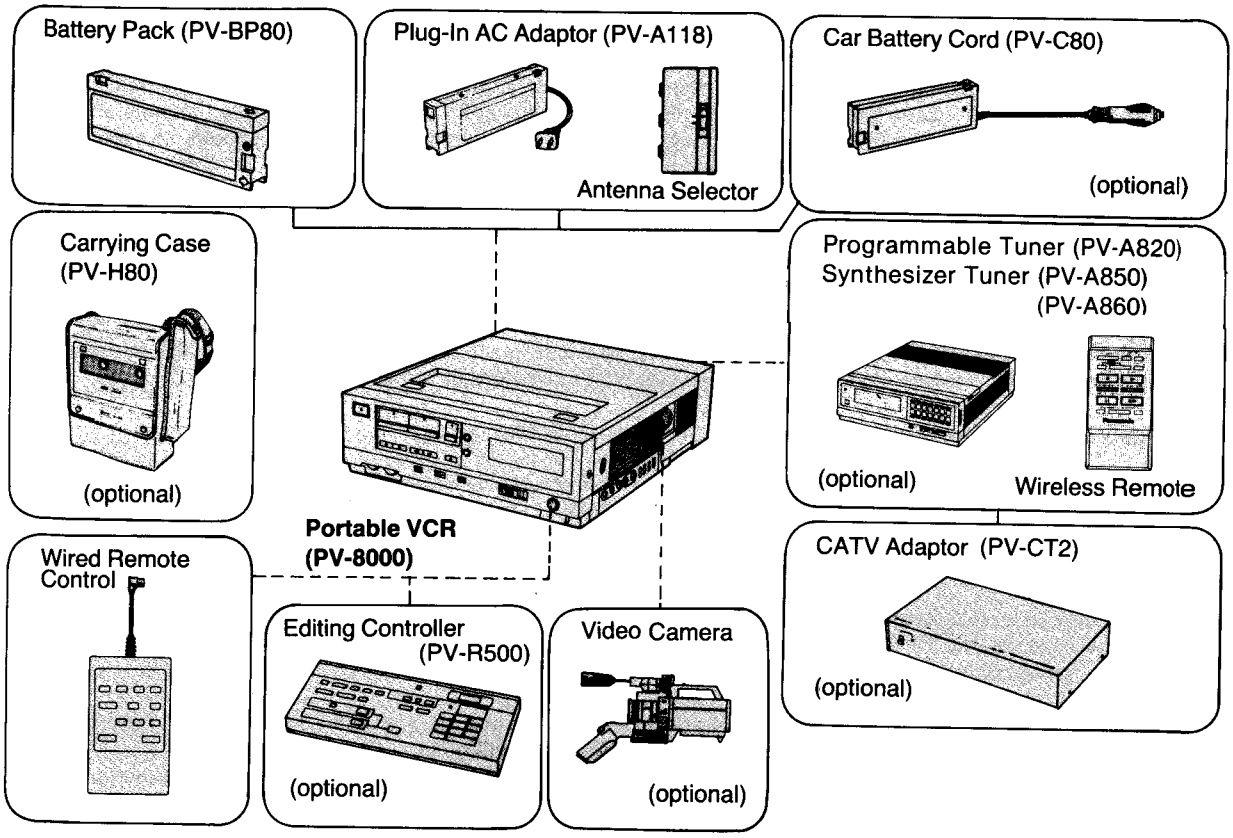
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

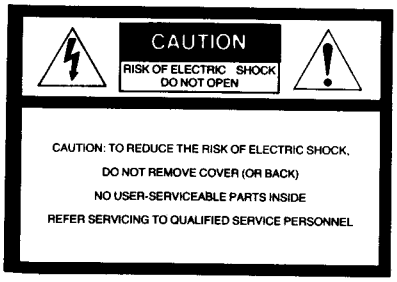
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

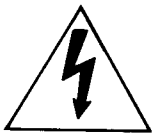
PORTABLE SYSTEM/FEATURES



FEATURES

- Compact and light
- G4 heads to produce noiseless still/slow pictures
- 2-channel (stereo)Audio
- 12 Function Wired Remote Control



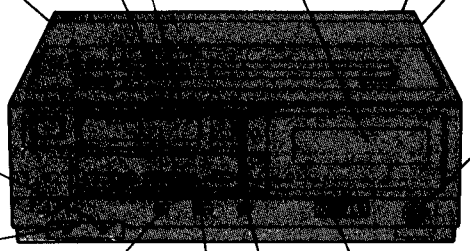


This symbol warns the user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.

This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.

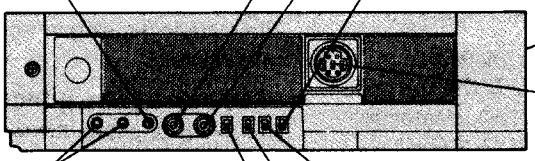
DESCRIPTION OF CONTROLS

TOP and FRONT



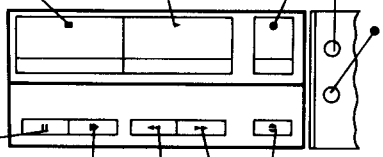
- **ADAPTOR-CONNECTOR (on rear)**
  This is used to connect the RECORDER to the TUNER with a single connection.
- **CASSETTE HOLDER**
- **Push Button Controls** (See next page.)
- **BATTERY EJECT BUTTON (on side)**
  To remove the Battery, push this button.
- **INDICATOR PANEL** (See next page.)
- **RF OUTPUT CONNECTOR (on rear)**
  Alternate connection to a TV. This is the RF Convertor (Channel 3 or 4) output.
- **TRACKING CONTROL**
  Normally this control is left in the center (detent) position, however if the playback picture contains bands of noise, readjust this control until the noise disappears.
- **REMOTE CONTROL JACK**
  For connecting the Editing Controller (optional) or the Wired Remote Control.
- **SLOW TRACKING CONTROL**
  If the slow-motion or still picture contains bands of noise, this control may require adjustment.
- **POWER SWITCH**
  This switch is used to turn the RECORDER on and off.
- **CAMERA REMOTE SWITCH**
  When Camera Recording, this switch may be set to ON, if the remote control feature of your camera is to be used. When the camera you are using does not have remote control features set this switch to OFF.
- **TAPE THICKNESS SWITCH**
  This switch is used to account for tape thickness when calculating the remaining tape time. When T-160 tape is used, set this switch to THIN. Otherwise, leave it at NORMAL.
- **TAPE SPEED SELECTOR (SP/LP/SLP)**
  Set this selector for the desired tape speed of a recording.

SIDE



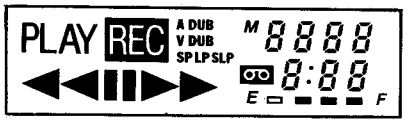
- **VIDEO OUTPUT CONNECTOR**
  For connecting to a Monitor TV or another VCR.
- **EARPHONE/AUDIO OUT JACK**
  For connecting an Earphone, or a Monitor TV and another VCR using Audio-Output Cord.
- **VIDEO INPUT CONNECTOR**
  For connection from another VCR.
- **RF CONVERTER CHANNEL SELECTOR**
  Set to channel 3 or 4, whichever is not used in your area.
- **BATTERY COMPARTMENT**
- **CAMERA INPUT TERMINAL**
  For connecting a portable video camera (optional).
- **MICROPHONE INPUT JACK (L/R)**
  For connecting a Microphone or Stereo Line Adaptor. This is useful for recording and Audio Dubbing.
- **CAMERA STEREO/MONO SWITCH**
  During Camera Recording with a stereo camera, set this switch to STEREO.
- **AUDIO SELECTOR SWITCH**
  This switch is used to select the audio signal for the TV speaker.
- **NR SWITCH**
  Set this switch ON for audio noise reduction.

PUSH BUTTON CONTROLS



- **PLAY BUTTON**
  Push this button to play back recorded tapes. "PLAY" and " ▶ " appear on the Indicator Panel.
- **STOP BUTTON**
  Push this button to stop the tape.
- **EJECT BUTTON**
  Push this button to insert or to remove cassette.
- **PAUSE/STILL BUTTON**
  Push this button to temporarily stop the tape movement in either the recording or playback mode. During playback, a still picture is produced when the pause is used. Push again to release pause. When this button is pushed "PLAY" and " ▮▮ " appear on the Indicator Panel.
- **SLOW BUTTON**
  While viewing a still picture, push this button to advance the picture one frame at a time. "PLAY" and " ▮▮ " appear on the Indicator Panel. During the playback mode, pushing this button will allow you to view a slow-motion picture. When this button is pushed, "PLAY"and " ▶▮ " appear on the Indicator Panel.
- **RECORD BUTTON**
  Recording is started by pushing this button and the PLAY Button at the same time. " REC " and " ▶ " appear on the Indicator Panel.
- **RESET BUTTON**
  Pushing this button causes the Tape Counter to return to "0000".
- **MEMORY BUTTON**
  When this button is in the "ON" position, the tape will stop when the Tape Counter reaches "0000" during forward or reverse tape movement in FF, REWIND or VIDEO DUB.
- **AUDIO DUB BUTTON**
  When this button is pushed simultaneously with the PLAY Button, sound from another source can be recorded on the tape in place of the original sound.
- **FAST FORWARD/SEARCH ▶▶ BUTTON**
  Push this button to move the tape forward rapidly. " ▶▶ " appears on the Indicator Panel.
  During the playback mode, holding this button down will allow you to view the picture in the forward direction rapidly. "PLAY" and " ▶▶ " appear.
- **REWIND/SEARCH ◀◀ BUTTON**
  Push this button to rewind tapes. " ◀◀ " appears on the Indicator Panel. During the playback mode, holding this button down will allow you to view the picture in reverse rapidly. "PLAY" and " ◀◀ " appear.

INDICATOR PANEL



- **FUNCTION INDICATOR " PLAY REC ◀◀ ▮▮ ▶▶ "**
  This shows the mode of VCR (PLAY, REC, REW, FF, PAUSE, STILL, SEARCH, FRAME ADVANCE, SLOW).
- **DEW INDICATOR " 💧 "**
  This indicator appears if excessive moisture condenses in the unit. If the DEW Indicator is ON, the unit will not operate. If this happens, the DEW Indicator will flash for about 3 seconds and the RECORDER will automatically turn off. In this case, wait until the indicator no longer flashes when the RECORDER is turned on again.
- **CASSETTE-IN INDICATOR " ⊙⊙ "**
  This indicator shows the condition of the cassette tape in the unit.
- **MEMORY INDICATOR "M"**
  When MEMORY Button is set to ON, this indicator appears.
- **DUBBING INDICATOR "A DUB" "V DUB"**
  When audio dubbing or video dubbing is set, this indicator appears.
- **REMAINING TAPE INDICATOR " 8:88 "**
  This indicator shows the remaining length of tape time in 5-minute units.
- **BATTERY INDICATOR " E ▭ ▬ ▬ F "**
  This indicator shows the condition of the battery charge.
- **TAPE COUNTER " 8888 "**
  Tape counter number is displayed.

GLOSSARY OF TERMS

ACC

Automatic Color Control used to maintain an overall constant color signal level in the color circuits.

ACK

Automatic Color Killer.

Adjacent Track

This is the name of the video track to the immediate left or right of the track of concern.

AFC

Automatic Frequency Control used to phase-lock the color circuits to either the recording or playback color signal, in order to achieve a stable color signal.

AFT

Automatic Fine Tuning...This is a special circuit found in most recent TV sets which makes the local oscillator of the TV tuner follow the channel of concern in order to produce a stable IF frequency. In other words, if for any reason the TV station being received changes frequency, the AFT circuit will automatically compensate so that no interference will be seen on the screen, i.e., no manual fine tuning is necessary.

AGC

Automatic Gain Control used to maintain an overall constant picture level in the luminance circuits.

APC

Automatic Phase Control used to help phase lock the color circuits to either the recording or playback color signal in order to achieve a stable color signal.

Azimuth

A term used to describe the left to right tilt of the gap of a recording head, if it could be viewed straight on.

Balanced Modulator

A circuit so designed to give as an output the frequency sum or frequency difference of its two input signals. Any special characteristics of one of the input signals will be present in the output signal.

Beats

A term used to described the unwanted signals produced when two original signals are allowed to be mixed together.

Bipolar PG

Pulse Generator signals that have both positive and negative excursions.

Burst

A short time occurence (8 to 10 cycles) of the 3.58MHz subcarrier signal, appearing right after horizontal sync but centered on the blanking portion of the video waveform. Burst is used to keep the color oscillator of a TV receiver locked to the broadcast station.

B/W

Abbreviation for Black and White.

C

Capacitor.

C Signal

The color portion of a video signal.

Capstan

A small rotating metal dowel which drives the recording tape to assure positive tape movement.

Chroma

The color portion of a video signal.

Chrominance

The color portion of a video signal.

Clamp

The process of giving an AC signal a specific DC level.

Control Signal

A special signal recorded onto the video tape which is used during playback as a reference for the servo circuits.

Converted Subcarrier

This is the process of frequency shifting the color 3.58MHz subcarrier and its sidebands down to 629kHz.

Crosstalk

The name given to the unwanted signals obtained when a video head picks up information from an adjacent track.

CUE

To scan the playback picture at a faster than normal speed in the Forward direction.

D

Diode.

DL

Delay Line.

Dark Clip

After emphasis, the negative going spikes (undershoot) of a video signal may be too large in amplitude for safe FM modulation. A dark clip circuit is used to cut off these spikes at an adjustable level.

DDC

Direct Drive Cylinder...as used in VHS, this means that the video heads are driven by a self-contained brushless DC motor using no belts or gears. DD cylinders produce pictures with better stability.

Delta Factor (Δf)

A term used to indicate that a playback signal off the video tape has some jitter or "wow and flutter". Δf, or "a change in frequency" means that the color signal off the tape is not a stable frequency of 629kHz, but rather a signal whose frequency at any instant is some small amount above or below 629kHz.

Deviation

A term used to describe how far the FM carrier swings when it is modulated. In VHS the upper limit is 4.4MHz.

Dew Detector

A variable resistor whose resistance value depends upon the ambient humidity.

Dihedral

A term used to describe the relative position between the two video heads as they are mounted in the head cylinder. Perfect dihedral means that the tips of the heads are exactly 180° apart.

Dropout

A momentary absence of FM or color signal off the tape, whether due to uneven oxide or a coating of dust on the tape or video heads.

Duty Cycle

In describing a rectangular waveform, the "duty" refers to the percentage of off time and on time for one complete cycle. 50—50 means that there are equal periods of off time and on time for one cycle and this would be a square wave.

E-E

Electronics to Electronics...this is the picture viewed on the TV set when a recording is being made. This picture goes through some but not all of the circuits of the recorder and is used to test the operation of said circuits.

EQ

Shortened form of "Equalization", used in the audio circuits.

Emphasis

The process of boosting the level of the high frequency portions of the video signal.

FG

Frequency Generator used in the servo circuits.

FL

Filter.

FM Signal

The luminance portion of the video signal is used to control the frequency of astable multivibrator. The output of this multivibrator is a frequency modulated (FM) signal shifting from 3.4MHz to 4.4MHz (plus sidebands).

Field

One half of a television picture. A field consists of 262.5 horizontal scanning lines across the picture tube. Two fields are necessary to complete a fully scanned TV picture (frame). First, one field is "sprayed" on the picture tube, starting at the top of the tube with Line 1, and ending at the bottom with Line 262.5. Then, the next field begins at the top of the tube again with Line 262.5 and ends at the bottom with Line 525. The lines of the second field lie in-between the lines of the first field. This property of falling in-between lines is called "interlacing". The two sweeps of the picture tube, or two fields make up one complete TV picture of "frame". Frame repetition is 30Hz, therefore field repetition is 60Hz.

Flagwaving

This is the term used to describe a TV sets ability to accept unstable playback pictures from a video tape recorder. All home VTR's have some degree of playback instability. A TV set with a long horizontal AFC time constant may not recover from the VTR's instability before the active picture is being scanned. This can cause a bending or flapping from side to side of the top inch or so of the screen. This movement is called "flagwaving".

Frame

One complete TV picture. See "Field".

Gate

A circuit which will deliver an output only when a specific combination of its inputs are present. For use in analog or digital applications.

Guard Band

This is the space between video tracks on the video tape in the SP mode. Guard bands contain no information.

Hall Effect IC

An external magnetic field causes current to flow in this type of device.

HD

Horizontal Drive signal.

Head Cylinder

A cylindrical piece of metal which houses the video heads. The tips of the heads protrude slightly from the surface of the cylinder so that they may scan the tape as the cylinder spins.

Head Switching

The action of turning off during playback, the video head which is not in contact with the video tape. A particular video head will be turned off 30 times per second. This is done so that the head which is not scanning the tape, and therefore not delivering a good signal, cannot contribute any noise to the playback signal.

Head Switching Pulse

The signal which is applied to the Head Amplifier to perform head switching. This is a square wave at 30Hz, with a 50—50 duty cycle.

Helical

A word used to describe a general type of VTR in which the tape wraps around the video head cylinder in the shape of a 3-dimensional spiral, or "helix". The video tracks are recorded as a series of slanted lines.

IC

Integrated Circuit.

Interchangeability

A term used to describe how well a particular VTR will play back a tape recorded on another VTR of the same type. Good interchangeability indicates good playback.

Interlacing

The property of the scan lines of two television fields to lie in-between each other. See "Field".

Interleaving

A term used to indicate that the harmonics of the chrominance signal lie in-between the harmonics of the luminance portion of the video signal as it is viewed on a spectrum analyzer. This means that the color information of a video signal does not interfere with, although it is broadcast at the same time as, the luminance information.

Also, signals which have this interleaving property are not readily seen on a TV screen, because of their virtual cancellation characteristics.

Interleaving signals (fi) must have the following frequency relationship:

$$fi = (\frac{2n+1}{2}) \times fH \ (n = 0, 1, 2, 3, 4.....)$$

$fH = 15{,}734\,Hz$ (H sync frequency)

Jitter

The name of the effect on the playback picture if a VTR has too much "wow and flutter". The picture appears to have a rapid shaking movement.

L

Coil.

Luminance

This is the portion of video signal which contains the sync and B/W information.

MMV

Monostable Multi-Vibrator...Usually an IC device which gives a logic high or low output with a variable duration upon receipt of an input pulse or transition.

Non-Linear Emphasis

This is similar to regular emphasis with the difference that small level high frequency portions of the signal are given more of a boost than higher level high frequency portions.

NTSC

The National Television Systems Committee. These four letters identify the United States color television standard.

O.T.R.

One Touch Recording (O.T.R.) enables you to do impromptu timer recordings at any time. When you have to go out for urgent matters or you are going to sleep, this function is very useful. Just select the channel and push the O.T.R. Button for 30 minutes to 2 hours of recordings. After recording, the VCR will be turned off automatically.

PG

Pulse Generator used in the servo circuits.

Q

A term used to describe the graphic response of a filter or tuned amplifier.

R

Resistor.

Review

To scan the playback picture at a faster than normal speed in the Reverse direction.

RF

Radio Frequencies.

Rotary Chroma

The name of the process used in VHS to change the phase of the chrominance signal at a rate of 15,734 (same as H sync frequency) times per second.

Rotary Transformer

A device used to magnetically couple RF signals to and from the spinning video heads, thus eliminating the need for brushes.

Sample and Hold

A process used in comparator circuits by which the value of a particular signal is measured at a specific moment in time...then this value is stored for later use.

Search

To scan the playback picture at a faster than normal speed in either the forward or reverse direction.

Servo

Short for Servo mechanism. This is an electro-mchanical device whose mechanical operation (for instance motor speed) constantly being measured and regulated so that it closely matches or follows an external reference.

Skew

Another way of saying Tension Error. Skew is actually the change of size or shape of the video tracks on the tape from the time of recording to the time of playback. This can occur as a result of poor tension regulation by the VTR, or by ambient conditions which affect the tape.

Subcarrier

The name of the 3.58MHz continuous wave signal used to carry color information.

SS

Slow and Still.

T

Transformer.

TP

Test Point.

TR

Transistor.

Tension Error

See "Skew".

Time Base Stability

A term used to describe how closely the playback video signal from a VTR matches an external reference video signal...in regard to sync timing rather than picture content.

Tracking

This is the action of the spinning video heads during playback when they accurately track across the video RF information laid down during recording. Good tracking indicates that the heads are positioning themselves correctly, and are picking up a strong RF signal. Poor tracking indicates that the heads are off track, and picking up low level RF signal or noise.

VCO

Voltage Controlled Oscillator...An oscillator whose frequency of oscillation is governed by an external voltage.

Video Head

This is the electro-magnet used to develop magnetic flux which will put RF information on the tape. In VHS, two video heads are mounted in a rotating cylinder around which the video tape is wrapped. As the cylinder spins, each video head is allowed to alternately scan the tape.

Video Track

The name of the RF information laid down during recording, as a particular video head scans across the tape.

VHS

Video Home System.

VTR

Video Tape Recorder.

VV

Video to Video...or...the actual playback picture produced from a tape during playback.

VXO

Voltage Controlled Crystal Oscillator...Similar to VCO except that a quartz crystal is sued as a reference which can be varied.

White Clip

After emphasis, the positive going spikes (overshoot) of the video signal may be too large for safe FM modulation. A white clip circuit is used to cut off these spikes at an adjustable level.

XTAL

Abbreviation for crystal.

Y Signal

The B/W portion of a video signal containing B/W information and sync.

ORDER NO. VRD-8403-507

Service Manual

Video Cassette Recorder

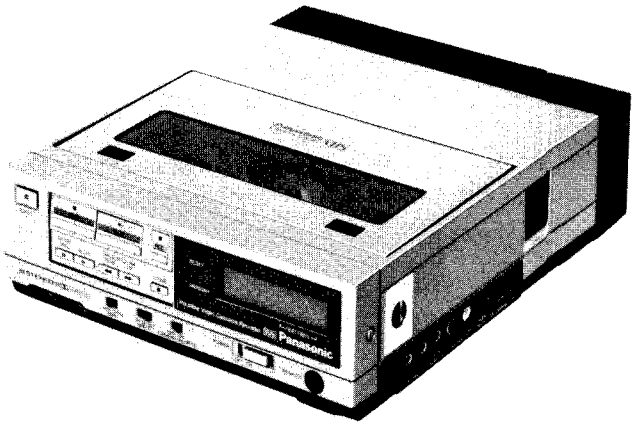
Vol. 2

Panasonic Omnivision VHS

PV-8000

Mechanical Adjustment Procedures

Electrical Adjustment Procedures



SPECIFICATIONS

Power Source:	12V DC Battery PV-BP80 Prog. Tuner Unit PV-A820 PV-A850 PV-A860 Plug-in AC Adaptor PV-A118
Power Consumption:	Approx. 10 watts (16W with Camera)
Television System:	EIA Standard (525 lines, 60 fields) NTSC color signal
Video Recording System:	4 rotary heads, helical scanning system Luminance: FM azimuth recording Color signal: Converted subcarrier phase shift recording
Audio Track:	2 track
Tape Format:	Tape width 1/2" (12.7mm), high density tape
Tape Speed:	SP mode: 1-5/16 i.p.s. (33.35mm/s) LP mode: 21/32 i.p.s. (16.67mm/s) SLP mode: 7/16 i.p.s. (11.12mm/s)
Record/Playback Time:	8 HRS. with 160 min. type tape used in SLP mode
FF/REW Time:	Less than 6 min. with 120 min. type tape
Heads:	Video: 4 rotary heads Audio: 2 stationary heads Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing
Input Level:	Video: VIDEO IN Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack (Left, Right) −70dB, 4kΩ unbalanced
Output Level:	Video: VIDEO OUT Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack (RCA type) −9dB, 600Ω unbalanced RF Modulated: Ch3/Ch4 switchable, 72dBμ, (Open Voltage) 75Ω unbalanced
Video Horizontal Resolution:	Color: more than 230 lines B/W: more than 230 lines
Audio Frequency Response: (10dB down)	SP mode: 100Hz~8kHz LP mode: 100Hz~6kHz SLP mode: 150Hz~5kHz
Signal-to-Noise Ratio:	Video: SP mode: better than 41dB LP mode: better than 41dB SLP mode: better than 41dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB LP mode: better than 40dB SLP mode: better than 40dB
Operation Temperature:	32°F—104°F (0°C—40°C)
Operating Humidity:	10%—75%
Weight:	5.7 lbs. (2.6kg)
Dimensions:	8-7/16"(W)×2-3/4"(D)×10-3/8"(H) (215mm×69.5mm×263mm)

Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

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MC-Service

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MECHANICAL ADJUSTMENT PROCEDURES (PART-1)

CAUTION

1. MECHANICAL ADJUSTMENT PROCEDURES in this manual are separated into 2 parts as described below.
2. PART (1) describes the items applicable to only this model.
3. PART (2) describes the common items applicable to all 1984 portable models. Therefore, please refer to appropriate items for servicing of this model.

DISASSEMBLY OF CABINET PARTS

1. DISASSEMBLY FLOWCHART

This flowchart indicates disassembly steps of the cabinet parts and the P.C. Boards in order to gain access to the items necessary for servicing.
When reassembling, perform the steps in the reverse order.
The bottom plate can be remove individually.

Note:

1. When removing the cabinet, work with care so as not to break the locking portions.

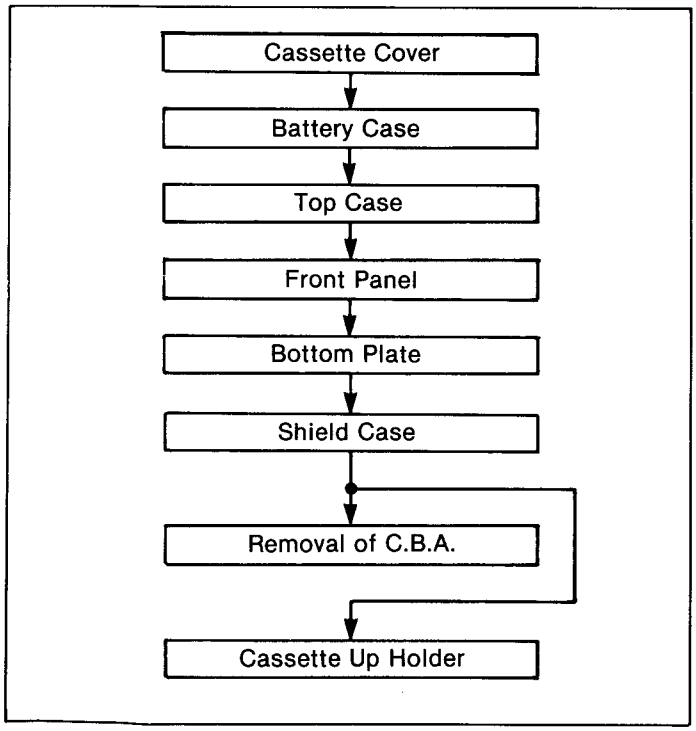


Fig. M1 Disassembly Flowchart

2. DISASSEMBLY METHOD

Notes:

1. Place the cloth or any other soft materials under the P.C. Boards or deck for preventing them being damaged while servicing.
2. When reinstalling, ensure the connectors are connected and any electrical components are not damaged.
3. Do not supply power to the deck during working except removal of the cassette cover.

2-1. Removal of the Cassette Cover

Supply power to the deck and turn it on. Then press the EJECT button to raise the cassette up holder.
Remove 2 covers and 2 screws. Then carefully lift and pull forward to remove.
Pay attention so as not to damage the locking portions.

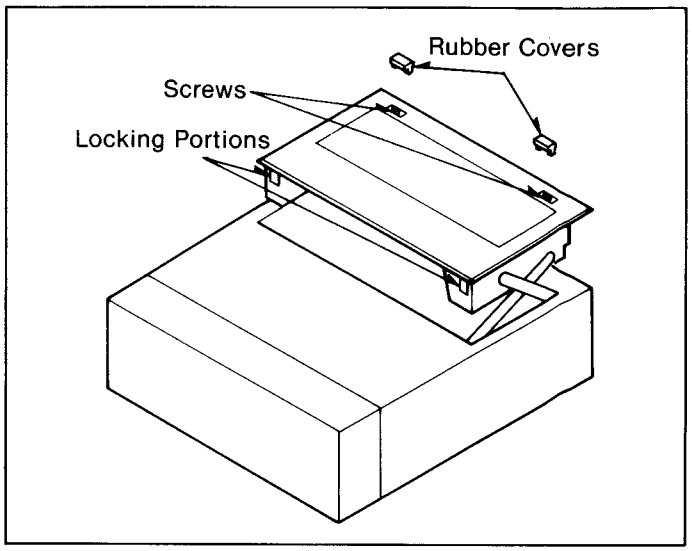


Fig. M2 Removal of the Cassette Cover

Note:

When reinstalling, align the locking portions of the cassette holder unit first.

2-2. Removal of Battery Case

1. First Comfirm that the battery is not inside the battery compartment.
   If it is, remove the battery.
2. Place the deck upside down so the bottom plate faces upward.
3. Remove 2 screws and hold both right and left ends of the Battery Case. Then carefully lift and pivot the top portion to remove.

Note:

When reinstalling, first align the locking portions into the slots of the top case.

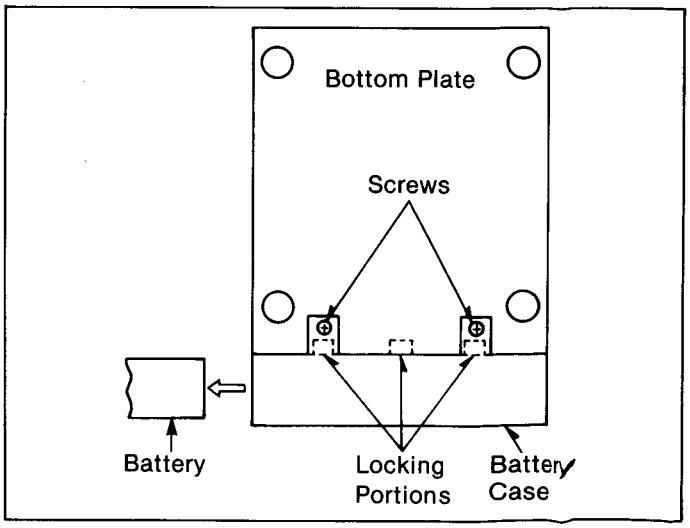


Fig. M3 Removal of the Battery

2-3. Removal of the Top Case

1. Remove the 2 screws (A) on the front panel.
2. Remove the 4 screws (B) on the top case. Then remove the top case by lifting the rear portion and pay attention so as not to damage the locking portions.

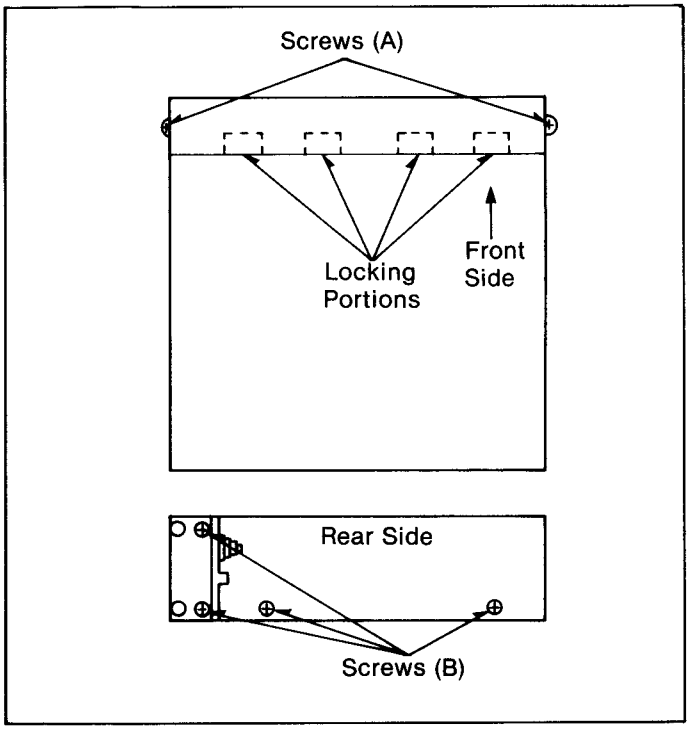


Fig. M4 Removal of the Top Case

Note:

When reinstalling, first align the locking portions into the projections of the front panel.

2-4. Removal of the Front Panel

1. Unlock the 2 locking tabs and holde both right and left ends of the front panel. Then carefully lift and pivot the bottom portion to remove.

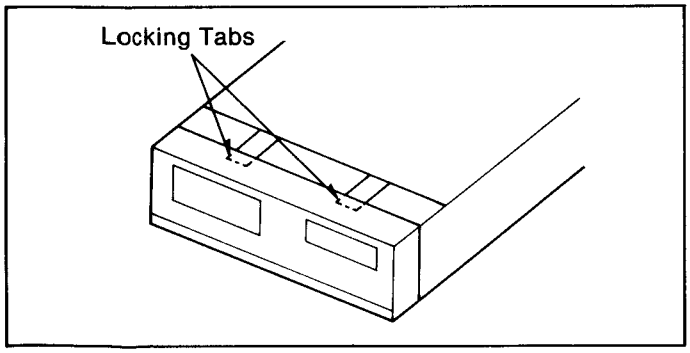


Fig. M5 Removal of the Front Panel-(1)

2. Disconnect a connector P34 and remove 3 screws on the operation button unit.
3. Lift the operation button unit and pivot the top portion to remove.

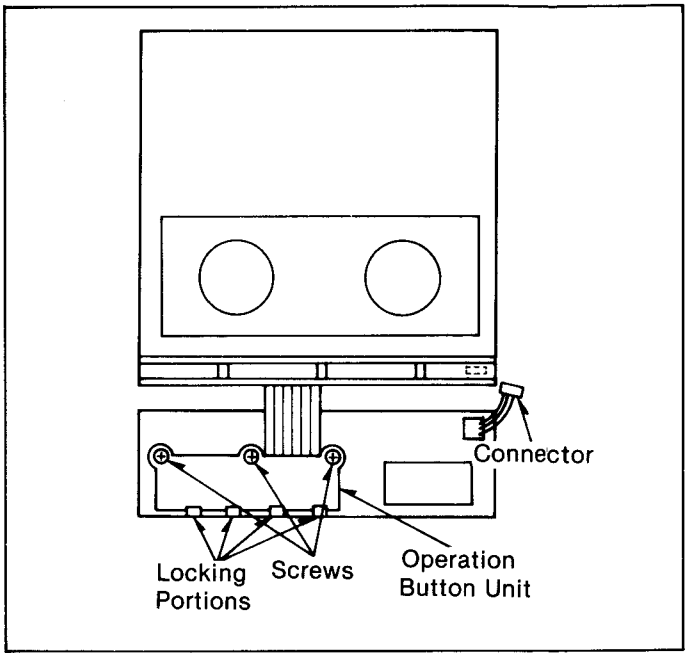


Fig. M6 Removal of the Front Panel-(2)

Note:

When reinstalling, first insert the Locking portions into the slot of the front panel.

2-5. Removal of the Bottom Plate

1. Place the deck upside down so the bottom plate faces upward.
2. Remove 4 screws. Then remove the bottom plate by lifting.

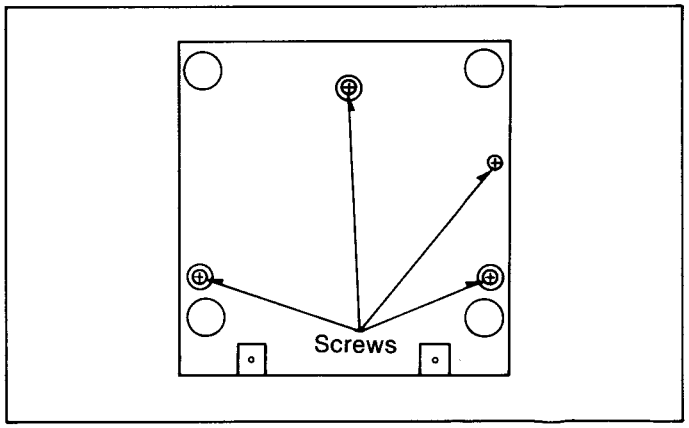


Fig. M7 Removal of the Bottom Plate

2-6. Removal of the Shield Case

1. Remove a screw and carefully lift it up to remove.

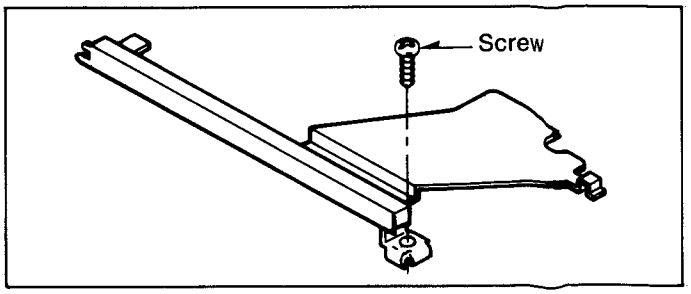


Fig. M8 Removal of the Shield Case

2-7. Removal of the Luminance/Chrominance/Audio C.B.A.

1. Disconnect the battery catcher with P1 and disconnect the multi-connector with P2 and P3.
2. Remove 2 screws.
3. Disconnect 2 direct connectors P20 and P21.
4. Remove a shield case and diconnect 2 connectors P22 and P23.

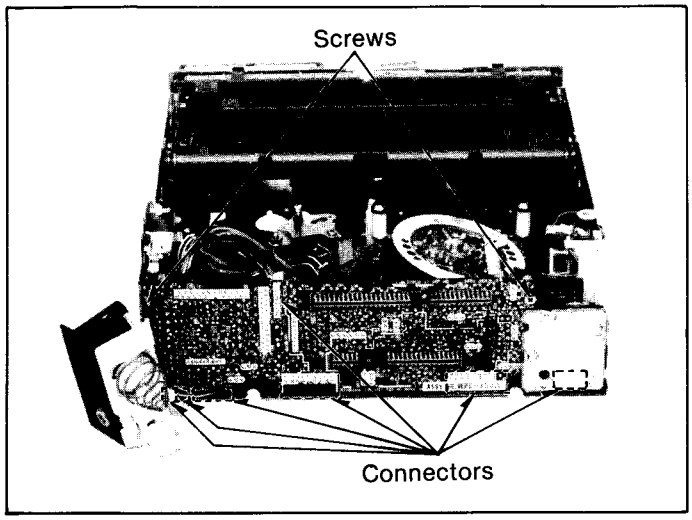


Fig. M9 Removal of the Luminance/Chrominance/Audio C.B.A.

Note:

Do not be damaged to the Film Integrated Circuit during removal of the Luminance/Chrominance/Audio C.B.A.

2-8. Removal of the Operation Button Unit

Pull the (A) portion. Then disconnect the flexible connector P31.

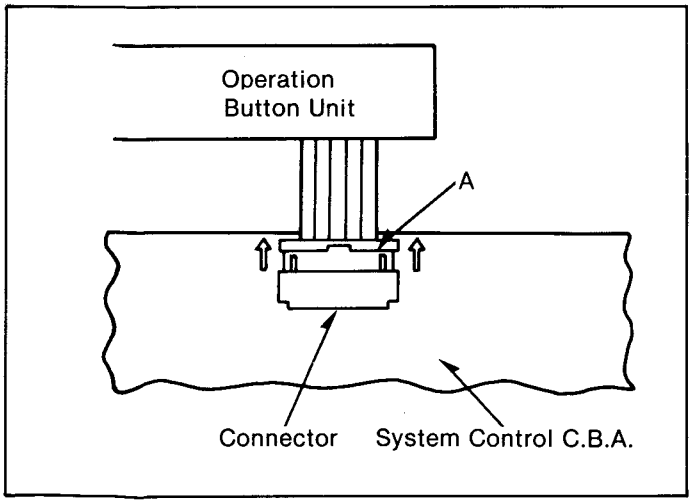


Fig. M10 Removal of the Operation Button Unit

2-9. Removal of the System Control C.B.A.

1. Unlock the 6 locking tabs and remove an insulation paper.
2. Disconnect the connector P32 and 2 flexible connectors P29 and P30.
3. Disconnect 2 hinges.

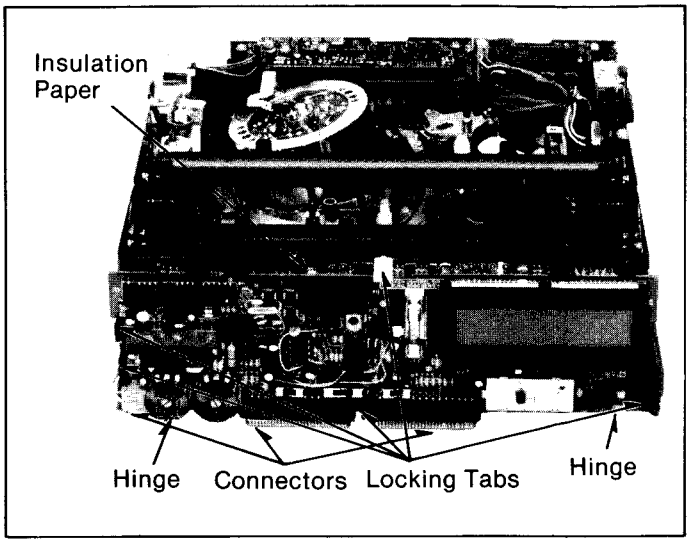


Fig. M11 Removal of the System Control C.B.A.

Notes:

1. Use extreme care so as not to damage the locking tabs.
2. Refer to Fig. M10 and disconnect 2 flexible connectors.

2-10. Removal of the Servo/A.V.R C.B.A.

1. Remove 3 screws on the Servo/A.V.R C.B.A. section. Then remove 5 screws on the Main C.B.A. (Refer to Fig. M13)
2. Disconnect 3 direct connectors P24, P25 and P26.

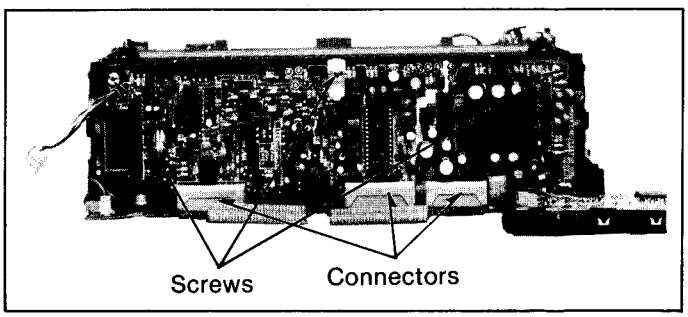


Fig. M12 Removal of the Servo/A.V.R C.B.A.

2-11. Removal of the Main C.B.A.

1. Place the deck upside down so the main C.B.A. faces upward.
2. Remove 5 screws and disconnect 2 flexible connectors P39 and P40.
3. Disconnect 3 connectors P14, P15 and P33, and disconnect 2 flexible connectors P35 and P36.

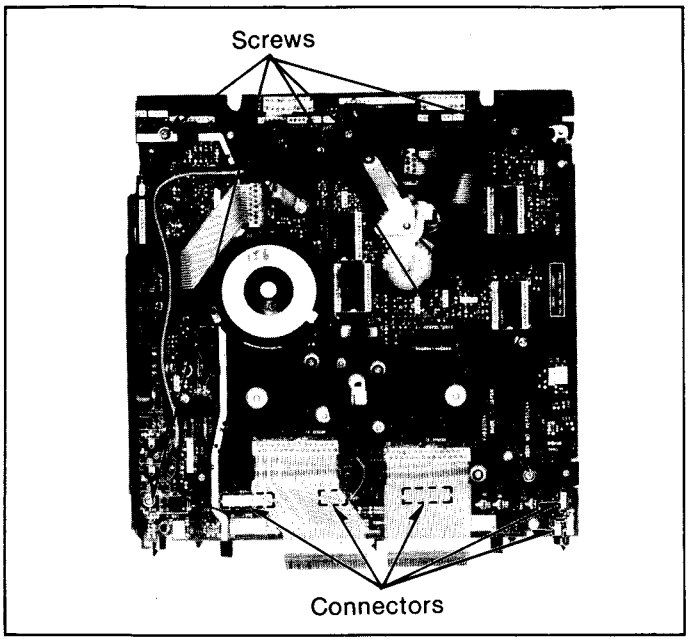


Fig. M13 Removal of Main C.B.A.-(1)

Note:

Refer to Fig. M10 and disconnect 4 flexible connectors.

4. Replace the deck so the chassis faces upward.
5. Disconnect 9 connectors P4, P5, P6, P7, P8, P9, P10, P11 and P19. Then lift a chassis.

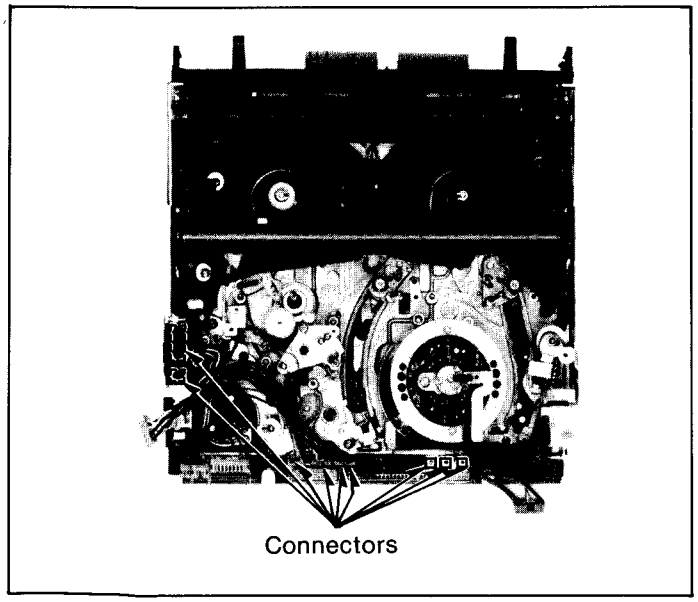


Fig. M14 Removal of Main C.B.A.-(2)

2-12. Removal of the Cassette Up Holder

Before remove the cassette up holder, open the system control C.B.A.

1. Remove 2 screws (A) on the front frame and 5 screws (B) on the chassis.
2. Eject the cassette up holder and disconnect a connector P8. Then remove the cassette up holder by lifting the front portion.

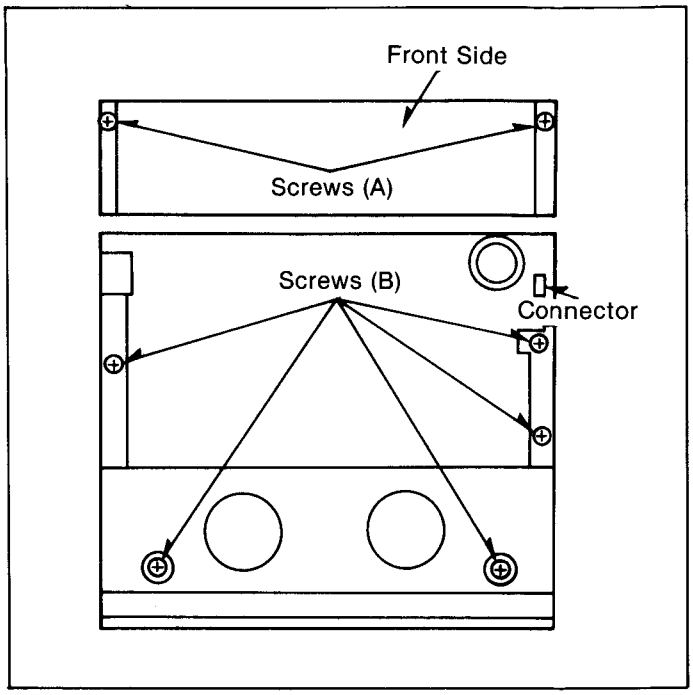


Fig. M15 Removal of the Cassette Up Holder-(1)

3. Remove a supply photo TR unit with a screw.

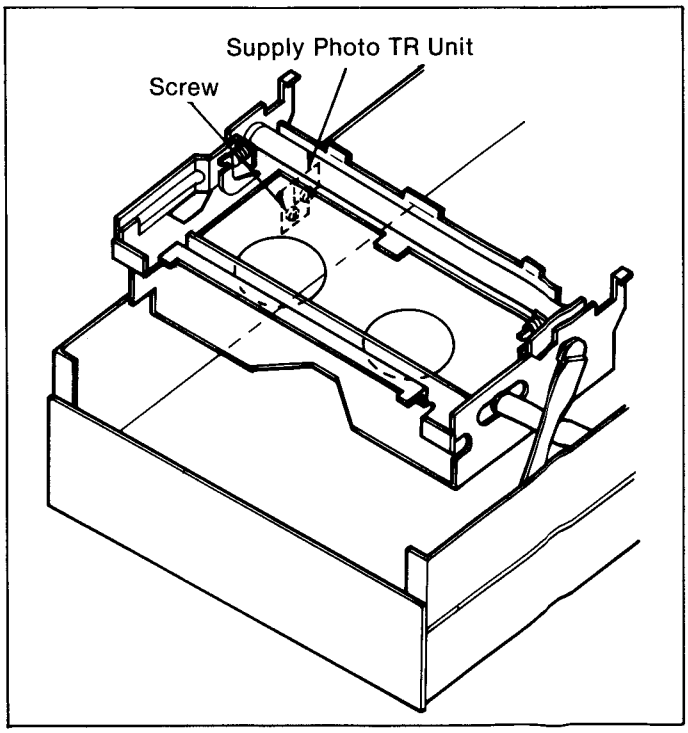


Fig. M16 Removal of the Cassette Up Holder-(2)

Note:

When reinstalling first insert the back portion.

ADJUSTMENT PROCEDURES

1. REPLACEMENT OF UPPER CYLINDER UNIT

Work with extreme care when removing or replacing the upper cylinder unit.
Do not touch video heads during servicing.

1. Unsolder the 8 lead wires on the Head Relay Board.
2. Remove the 2 screws (A) and gently lift the upper cylinder unit from the shaft.

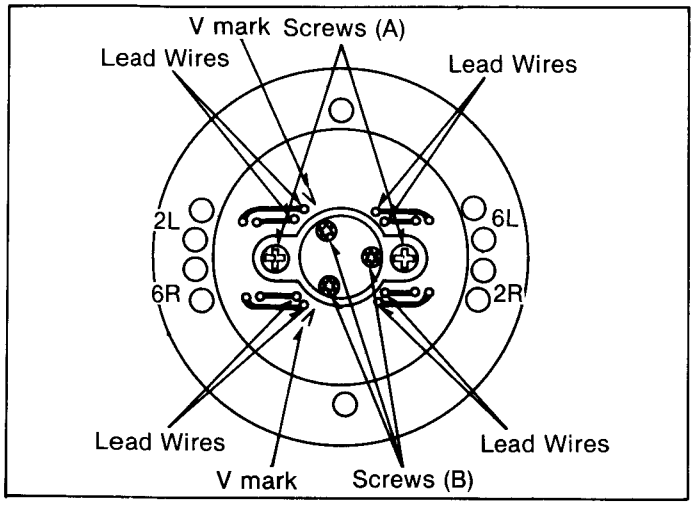


Fig. M17 Replacement of Upper Cylinder Unit-(1)

Note:

Do not remove the 3 screws (B).

3. Before reinstalling a new unit, clean the DD cylinder shaft and the surface that it engages with on the upper cylinder with a soft cloth saturated with Freon TF.

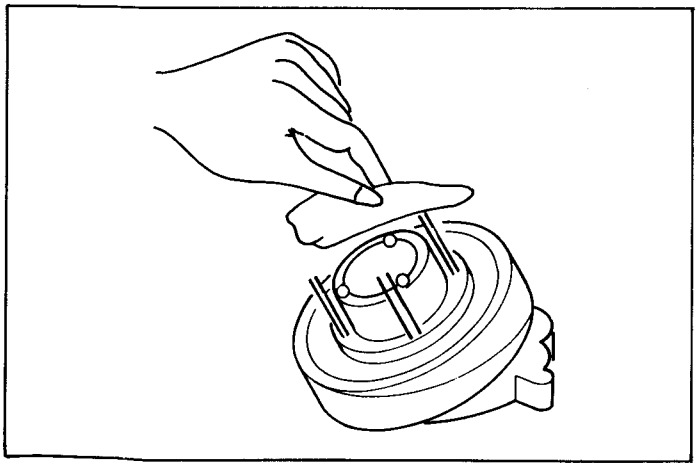


Fig. M18 Replacement of Upper Cylinder Unit-(2)

4. Install new unit carefully so that the 8 lead wires are properly matched on the Head Relay Board. For details on the installation position, refer to Fig. M17 and Fig. M19.

Note:

Install 8 lead wires with an extreme care not to damage them.

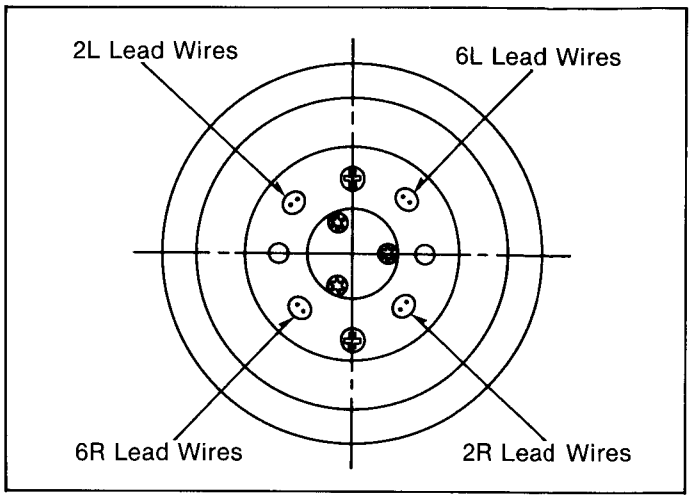


Fig. M19 Replacement of Upper Cylinder Unit-(3)

5. Tighten the 2 screws (A) and resolder the 8 lead wires to the Head Relay Board.
6. Clean the Upper Head Cylinder with a deerskin swab saturated with Freon TF.

Note:

Upon completion of replacement, confirm performance. And if required, perform "TAPE INTERCHANGEABILITY ADJUSTMENT".

2. ADJUSTMENT OF V-STOPPERS

Equipment Required:

V-Stopper Adjustment
Fixture VFKS0034

1. Remove the DD Cylinder Unit from chassis. (Upper Cylinder Unit does not need to be removed from the DD Cylinder motor.) Refer to "REPLACEMENT OF DD CYLINDER UNIT" section.
2. Loosen 4 screws and install the fixture. Push the V-Stoppers snugly against the pins and tighten the 4 screws.

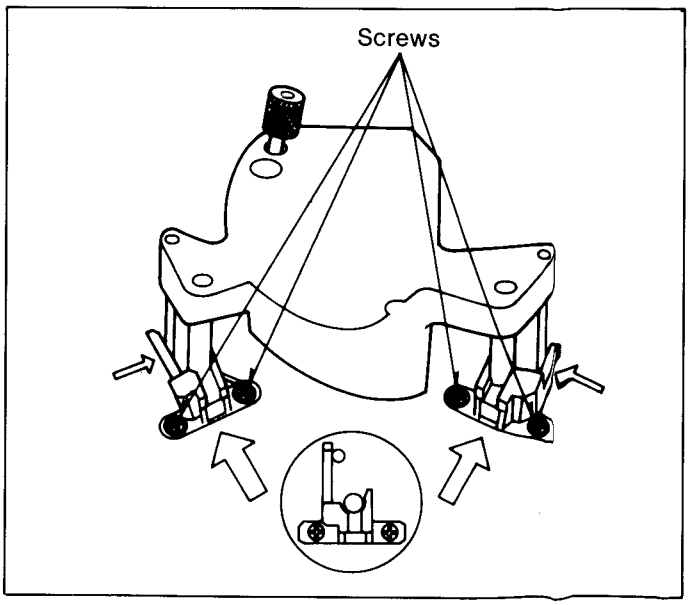


Fig. M20 ADJUSTMENT OF V-STOPPERS

3. CONFIRMATION AND ADJUSTMENT OF CAPSTAN SEAL

Specification: 0.1~0.3mm

Adjust the Capstan Seal so the height becomes as specified.

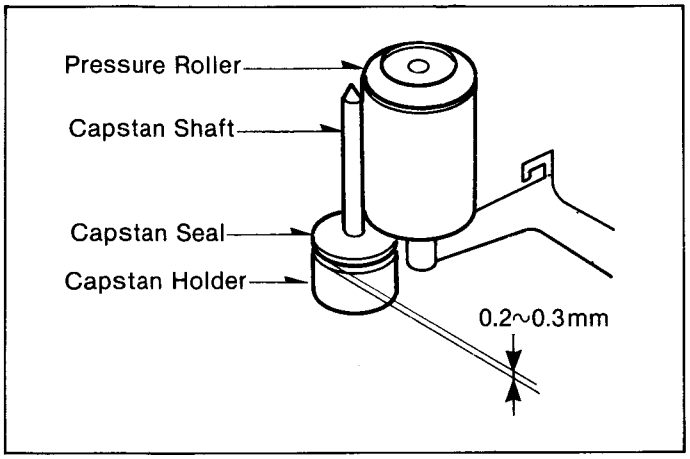


Fig. M21 Confirmation/Adjustment of Capstan Seal

Note:

Capstan Seal shall be out of contact with Pressure Roller and Capstan Holder.

SERVICE PROCEDURES

Work with extreme care when repairing the deck. Do not touch the metallic foil and the metal during servicing. When opening of C.B.A. or connection of Extension Cables do not supply power to the deck.

Notes:

1. The flexible wire has the conductors only on one side of both ends, therefore work with extreme care to be connected correctly with female connector.

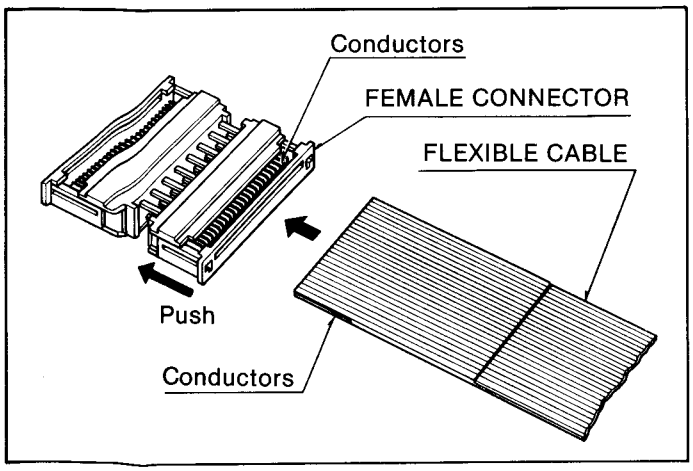


Fig. T1 Connection Method of Flexible Connector

If Flexible Cable is reversely connected, the unit will be in the STOP MODE or NON-OPERATIONAL condition. (In case of above reconnect cable correctly.)

2. When any checking is required in the RECORDING MODE, make short circuit of two pins of P33 on the MAIN C.B.A. Do not forget to remove short circuit when reassembling.
3. When connect the cable, first insert completely, then push the Female Connector. Take reverse step when disconnection.

1. OPENING OF C.B.A.

1. Remove 5 screws and disconnect 2 flexible connectors P39 and P40 on the Main C.B.A..
2. Unlock the 6 locking tabs on the System Control C.B.A. and remove the insulation paper. Use extreme care so as not to damage the locking tabs.

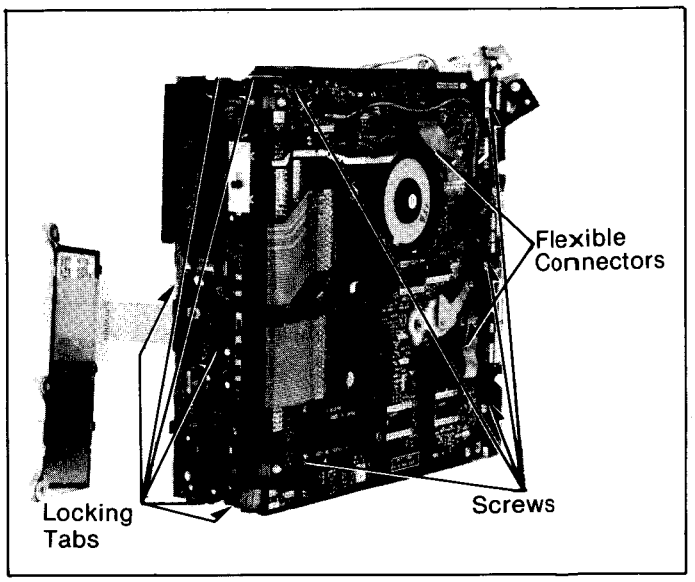


Fig. T2 Opening of C.B.A.-(1)

3. Remove 3 screws and disconnect 3 connectors P24, P25 and P26 on the Servo/A.V.R. C.B.A. Work with car not to damage the Film Integrated Circuit on the Luminance/ Chrominance/Audio C.B.A.

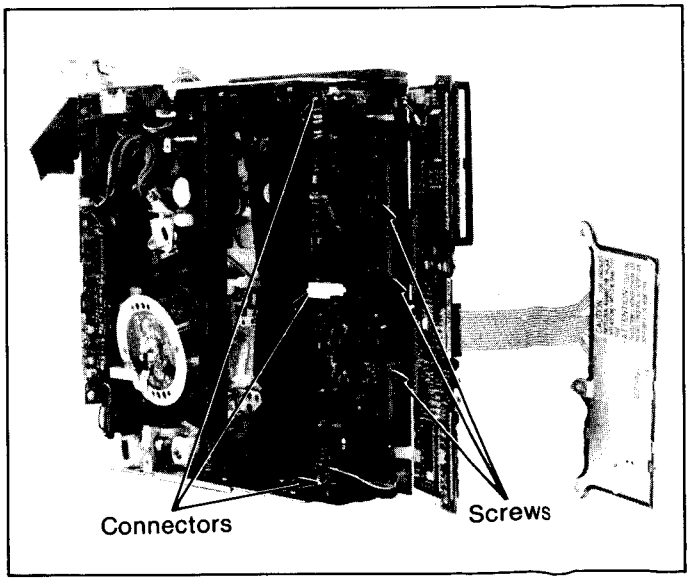


Fig. T3 Opening of C.B.A.-(2)

4. Disconnect 2 connectors (P33 and P15) and 2 flexible connectors (P35 and P36) on the Main C.B.A.

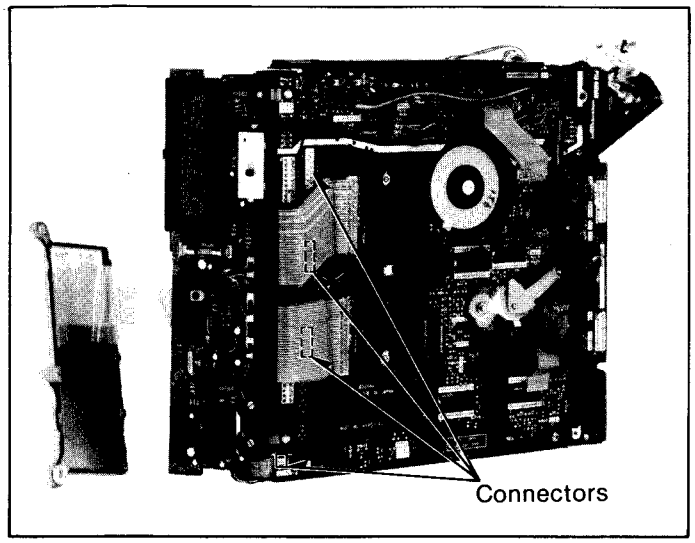


Fig. T4 Opening of C.B.A.-(3)

Note:

When closing the Main C.B.A., leads of P14 must be restored correctly in the front frame.

5. Remove 2 screws and disconnect 2 connectors (P20 and P21).
6. Loosen the clamper and open the shield case.

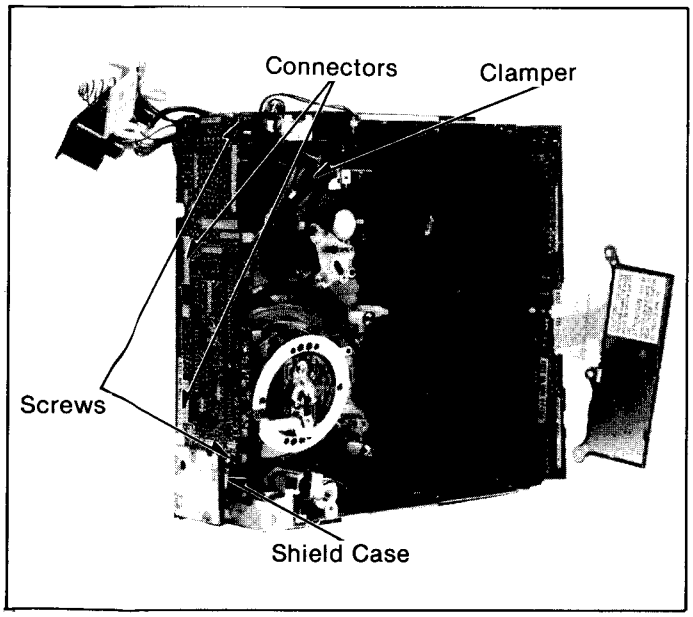


Fig. T5 Opening of C.B.A.-(4)

2. CONNECTION METHOD OF EXTENSION CABLES

Equipment Required:

Extension Cable Kit.....VFKS0035

Consists of

(1) Extension Cable (A) VFKS0036
(2) Extension Cable (B) VFKS0037
(3) Extension Cable (C) VFKS0042
(4) Extension Connector (A) VFKS0038
(5) Extension Connector (B) VFKS0039
(6) Extension Connector (C) VFKS0040
(7) Extension Connector (D) VFKS0041
(8) Extension Connector (E) VFKS0044

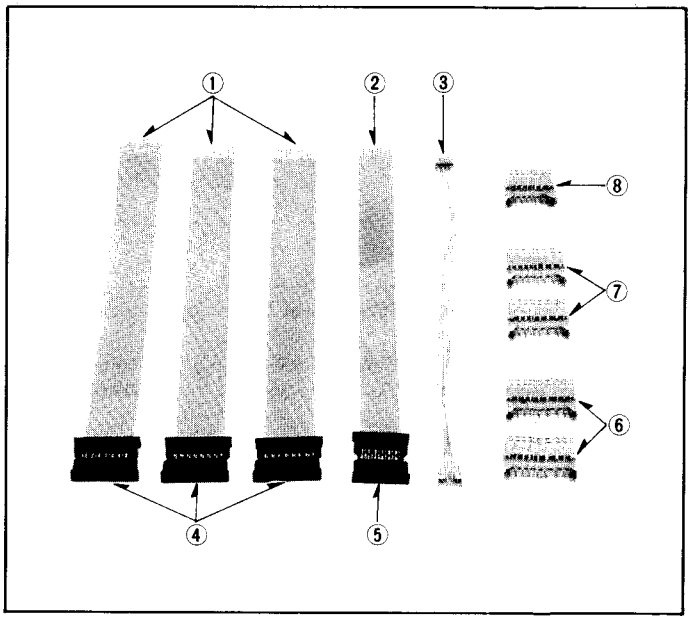


Fig. T6 Connection Method of Extension Cables-(1)

Note:

When connecting the flexible connector, refer to Fig. T1.

1. Connect the connector (E) between P20 and P13, and the Connector (D) between P21 and P12.

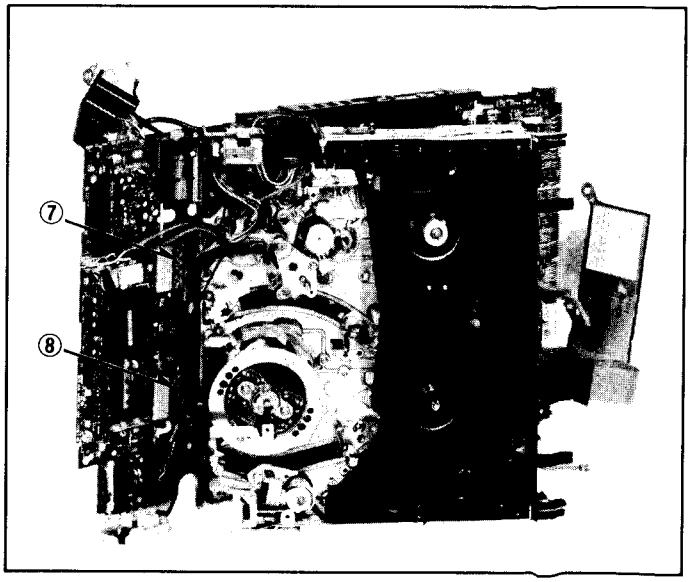


Fig. T7 Connection Method of Extension Cables-(2)

2. Extend the flexible connector P39 with the Cable (B) and the Connector (B). Then extend the flexible connector P40 with the Cable (A) and the Connector (A).

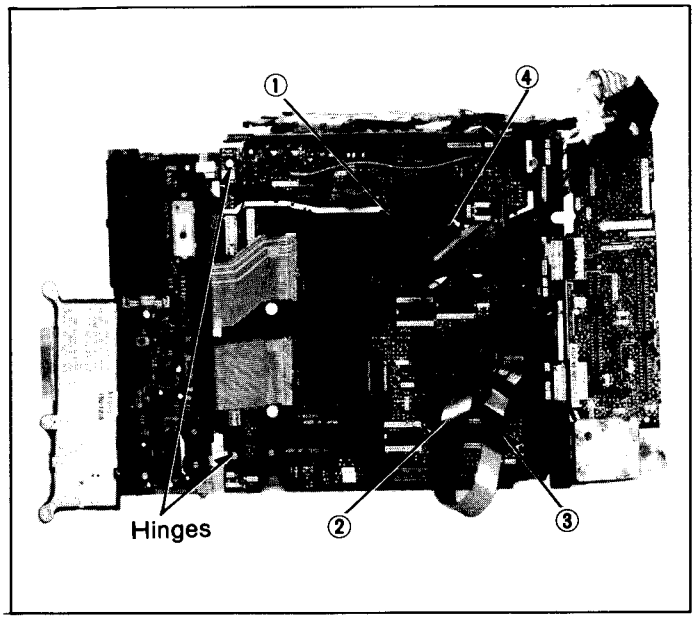


Fig. T8 Connection Method of Extension Cables-(3)

3. Extend the connector P15 with the Cable (C). Then extend the flexible connectors P35 and P36 with the Cable (A) and the Connector (A).
4. Unlock 2 hinges and connect 2 Connectors (C). One shall be connected between P16 and P26, and the other one between P17 and P25. Then connect the Connector (D) between P18 and P24.

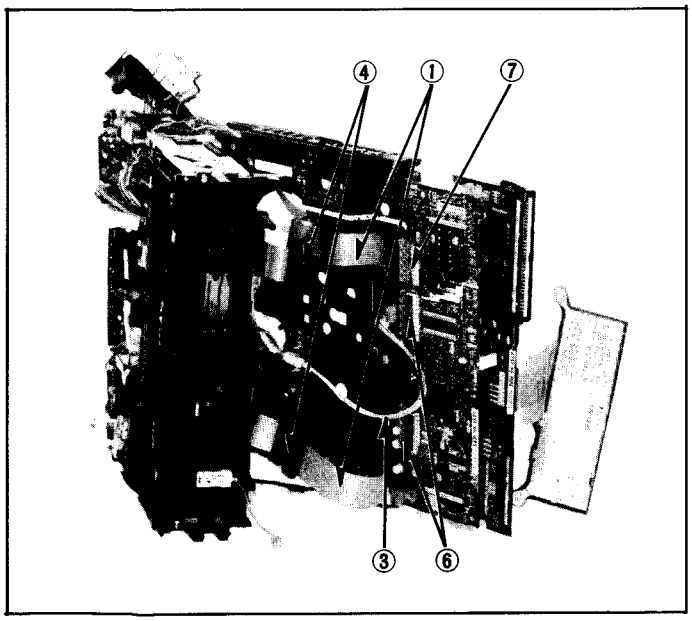


Fig. T9 Connection Method of Extension Cables-(4)

3. PURPOSE OF MULTI EXTENSION CABLE

When the Video Deck or Dockingable Tuner is inspected or repaired in condition of connecting them, Multi Extension Cable shall be used between Video Deck and Dockingable Tuner.

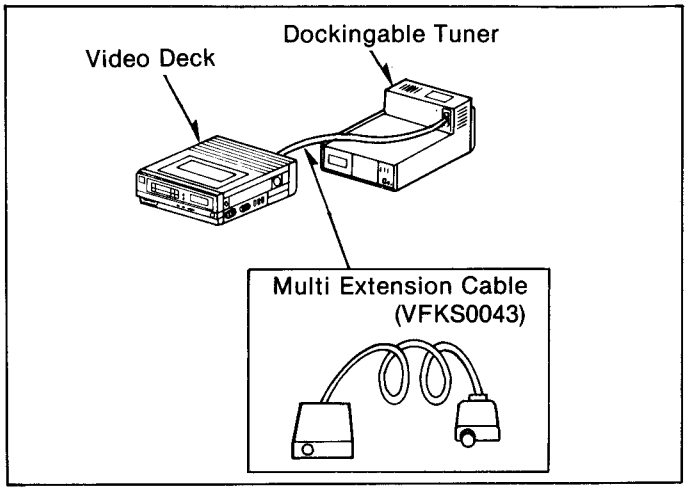


Fig. T10 Purpose of Multi Extension Cable

MECHANICAL ADJUSTMENT PROCEDURES (PART-2)

1. PROCEDURE FOR CLEANING OF UPPER CYLINDER UNIT

1. Position the video head to permit access for cleaning and hold the upper cylinder to keep it from turning while cleaning.
2. Gently rub the video head in direction of tape travel with Head Cleaning Stick moistened with Freon TF.
3. Repeat for the other video head.

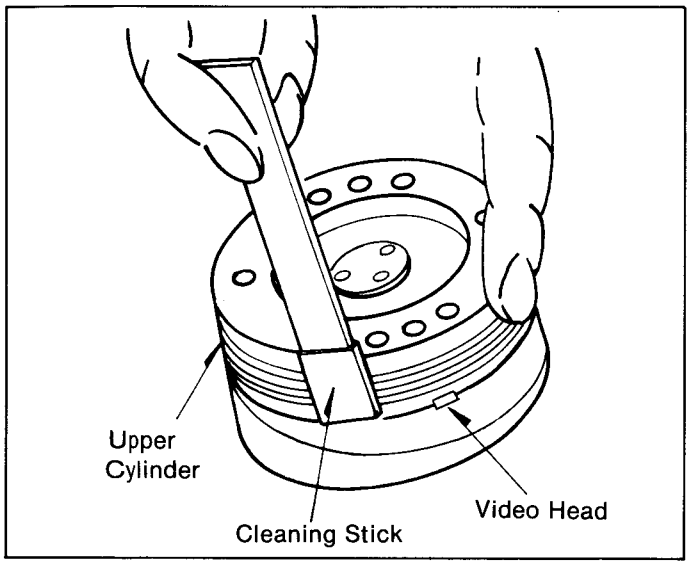


Fig. 1 Head Cleaning

Notes:

1. Do not rub vertically.
2. Do not apply any pressure to head.
   If contaminant is not easily removed, continued gentle wiping will usually remove the substance.
3. Do not rotate the Upper Cylinder Unit clockwise when cleaning it.

2. REPLACEMENT OF DD CYLINDER UNIT

Work with extreme care when removing or replacing the DD cylinder unit.
Do not touch video heads during servicing.

1. Remove the screw (A) and the Grounding Spring, then remove the screw (B) and the Grounding Plate Bracket.

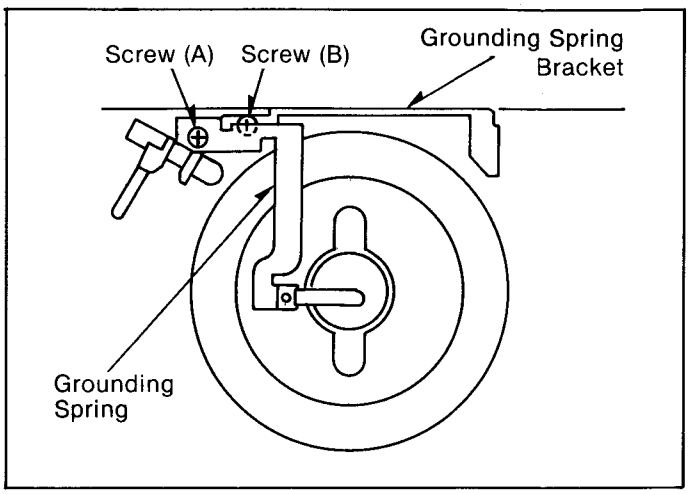


Fig. 2 Replacement of DD Cylinder Unit(1)

2. Disconnect 2 connectors under the cylinder section.
3. Remove the 3 screws and DD cylinder unit.

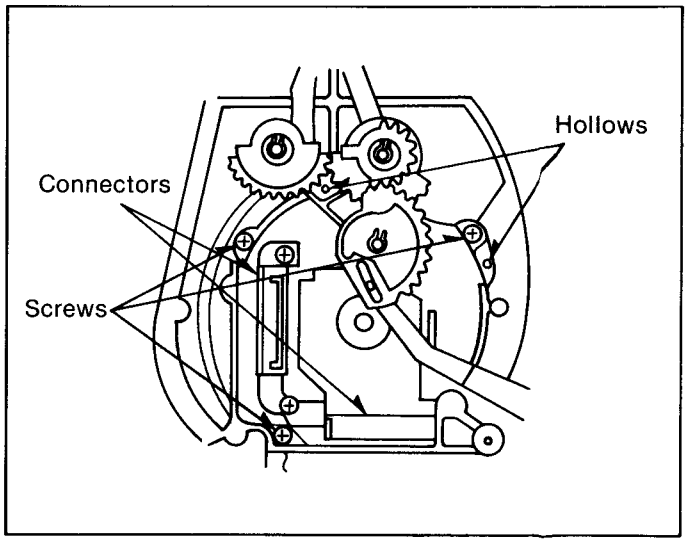


Fig. 3 Replacement of DD Cylinder Unit(2)

Note:

Since there is very little clearance between DD cylinder unit and chassis, remove the DD cylinder unit gently and carefully.

4. Reinstall the new cylinder unit, tighten the 3 screws. Then connect 2 connectors.

Note:

Reinstall the new DD cylinder unit, so that the projections (A) on the chassis agrees with the hollows (B) under the cylinder.

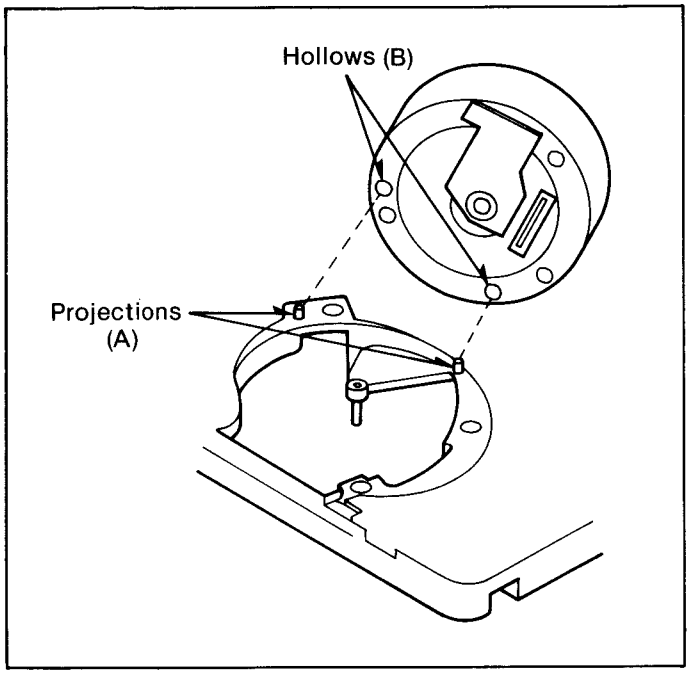


Fig. 4 Replacement of DD Cylinder Unit-(3)

Notes:

1. Gently rub the video head in direction of tape travel with Head Cleaning Stick moistened with Freon TF.
2. After replacement, confirm performance. If any further maintenance is required, perform "TAPE INTERCHANGEABILITY ADJUSTMENT".
3. After replacing the new DD cylinder unit, check to see if the Grounding Spring is correctly set in a position within 2mm to the right from the center of the cylinder shaft as shown in Fig. 5.
4. Never install the Grounding Spring to any position to left from the center of the cylinder shaft, but always within a maximum of 2mm to the right of the center of this shaft.

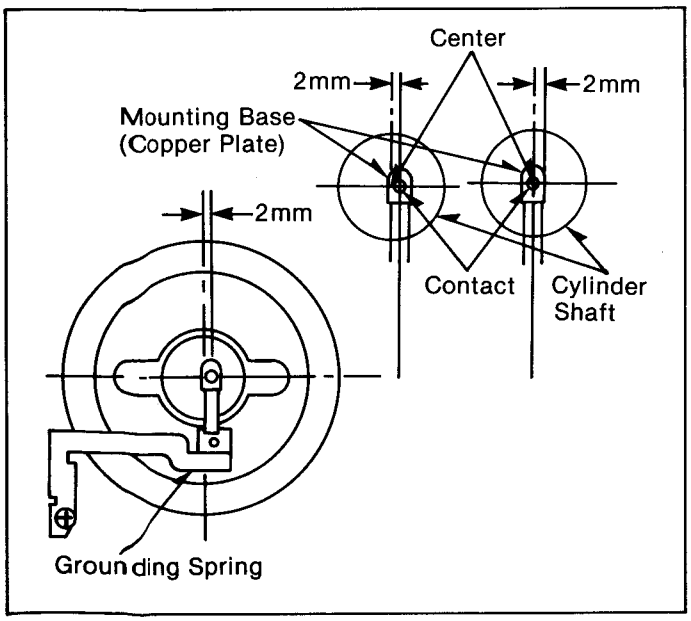


Fig. 5 Confirmation of GND Spring Installation Position

5. Do not touch Mounting Base with screws on the DD cylinder unit.

3. CONFIRMATION OF BRAKE TORQUE

Equipment Required:

Dial Torque Gauge
Adaptor for Gauge

1. Attach the adaptor to the torque gauge and place the deck in STOP mode.
2. Place the torque gauge on the reel table. The weight of gauge should not rest on the reel table.

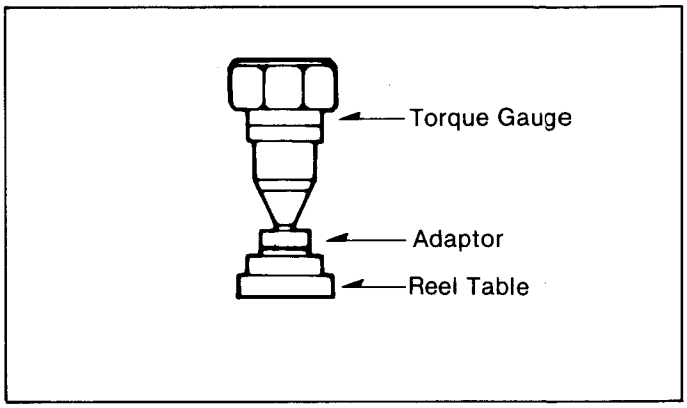
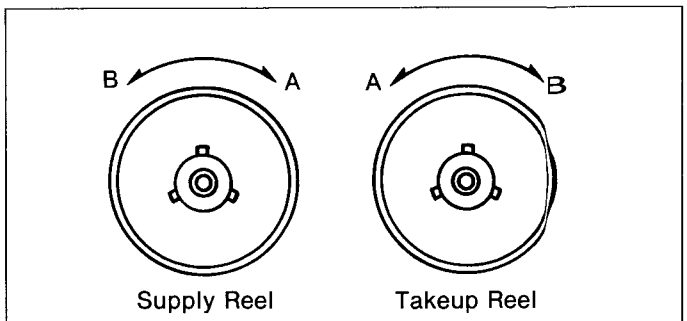


Fig. 6 Confirmation of Brake Torque-(1)

3. Turn torque gauge in either direction indicated in the Fig. 7 and read the gauge when the brake begins slipping.

Note:

If proper brake torque can not be obtained, clean the rotating surface of reel table with a soft cloth and recheck torque before replacing brake pad.



NTSC Model	A	B
Takeup	300~1,200g-cm	more than 80g-cm
Supply	350~1,200g-cm	more than 40g-cm

Fig. 7 Confirmation of Brake Torque-(2)

4. CONFIRMATION OF BACK TENSION

Equipment Required:

Back Tension Meter (Tentelometer, Model T2-H7-UM, Purchase Locally)
VHS Cassette Tape (120 Minutes Tape)

Specification: 25~30g

1. Pull the erase head in the direction indicated by the arrow and hold it by adhesive tape.
2. Play back the cassette tape recorded in the SP mode from its beginning and wait until tape running has stabilized. (for approx. 10 to 20 seconds)
3. Insert tension meter in tape path and confirm reading.

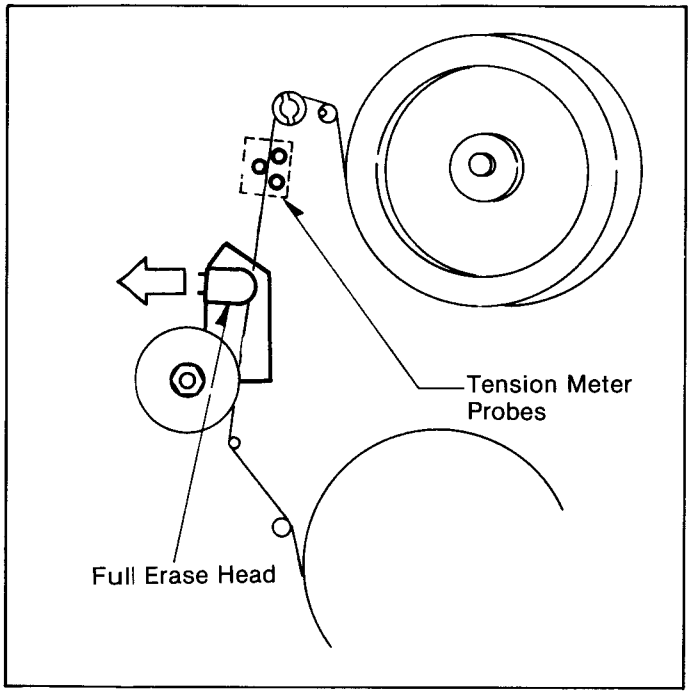


Fig. 8 Confirmation of Back Tension

Notes:

1. Make sure that the three probes of the meter are all in good contact with tape, but out of contact with any parts while measuring.
2. It is recommended to be measured three times as the tension meter is very sensitive.

5. HEIGHT ADJUSTMENT OF REEL TABLES

Equipment Required:

Post Adjustment Plate
Reel Table Height Gauge

Specification: .....0~-0.15mm

* Cut-out on Post Adjustment Plate is reference of reel table height and their height is measured based on this reference.

1. Place the post adjustment plate over the reels, and put the gauge on the plate. Set the gauge to zero "0" with the foot scraper of the gauge touching the cut-out portion of the plate.

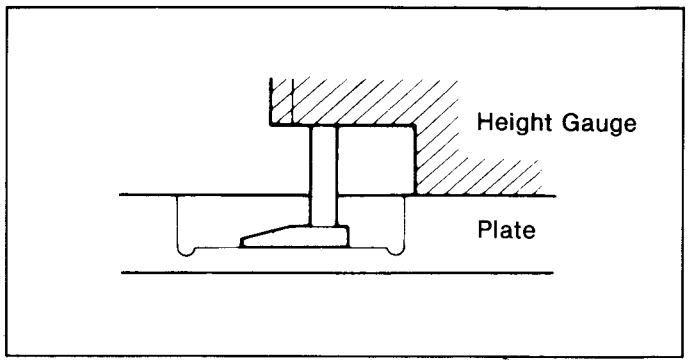


Fig. 9 Height Adjustment of Reel Tables-(1)

2. Then measure the top portion of reel table and confirm the difference just performed in former step. Do same for the other reel table.

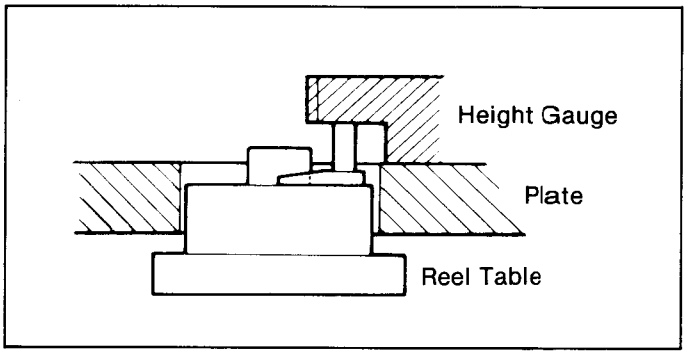


Fig. 10 Height Adjustment of Reel Tables-(2)

3. If a height difference in readings between the cut-out portion of plate and reel tables is not 0~-0.15mm (higher or lower), adjust the height of the reel to obtain specified height.
4. For adjustment add or reduce a washer located under the reel table.

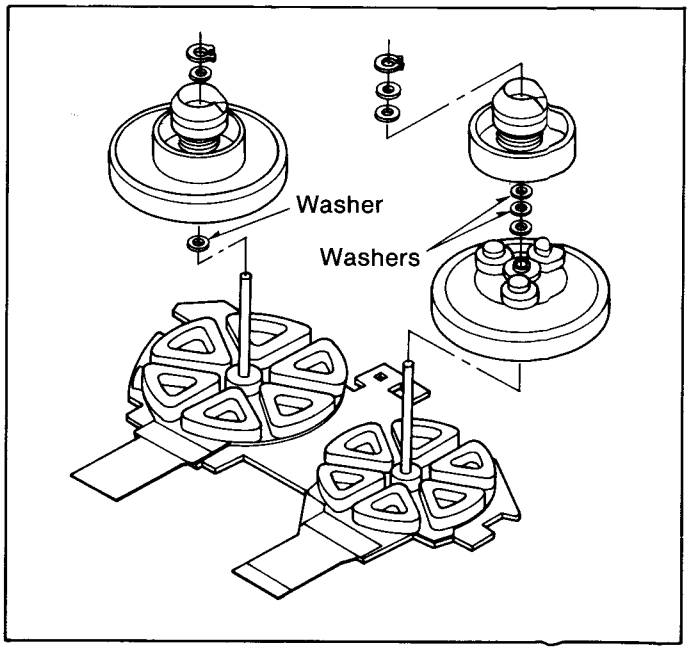


Fig. 11 Height Adjustment of Reel Tables-(3)

Note:

When adjusting the height of the tables, the DD Reel Unit needs to be removed from the chassis.
(Removal of the DD Reel Unit.)
Remove 7 screws and carefully lift it out.

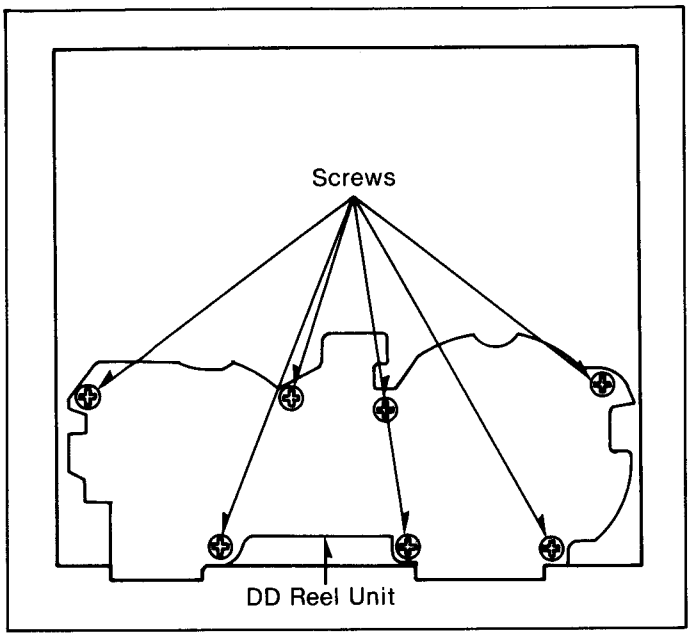


Fig. 12 Bottom View of DD Reel Unit

6. HEIGHT ADJUSTMENT OF TAPE GUIDE POSTS

Equipment Required:

Hex. Wrench (0.9mm)
Post Adjustment Plate
Reel Table Height Gauge
Nut Driver (5.5mm)
Post Adjustment Screwdriver

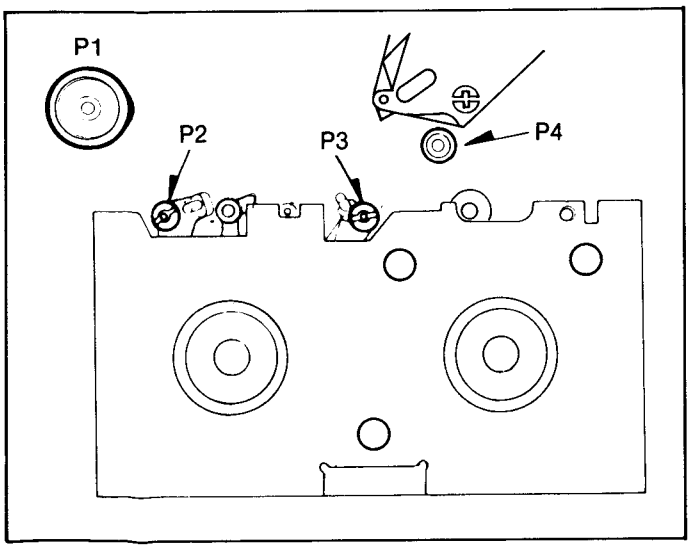


Fig. 13 Height Adjustment of Tape Guide Posts-(1)

1. First install the post adjustment plate and lower all posts if required so that they are the condition as shown.
(Lower end of post, tape guide, should be lower than foot scraper of gauge.)
Loosen a hex. screw located on the lower portion of posts (P2 & P3) then turn the top of the posts with post adjustment screwdriver.

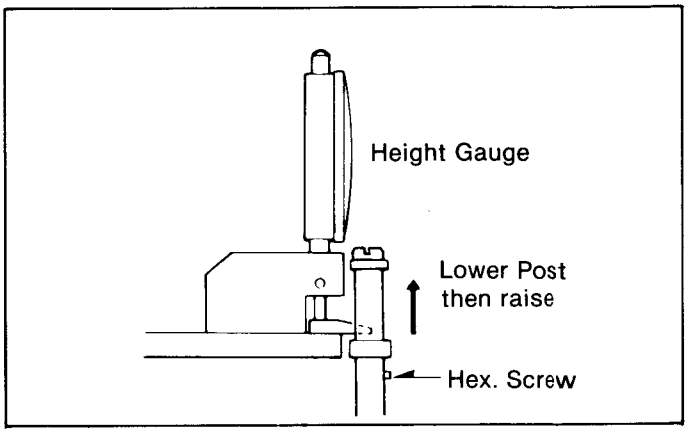


Fig. 14 Height Adjustment of Tape Guide Posts-(2)

2. Place the height gauge on the adjustment plate and place the foot scraper of gauge to the post.
(The foot scraper of gauge should be fully lowered till it touches the Post Adj. Plate.)

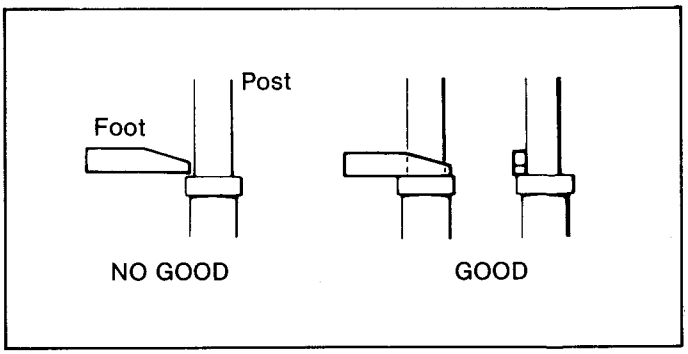


Fig. 15 Height Adjustment of Tape Guide Posts-(3)

3. Set the height gauge to zero and slowly raise the post until it just touches the foot scraper of gauge. For adjustment of P1 & P4, use the nut driver.

Note:

Upon completion of adjustment, tighten hex. screws on P2 and P3 and install the post cap on P4. When the post cap on P4 is reinstalled, orient it as shown below viewing from the direction indicated by the arrow.

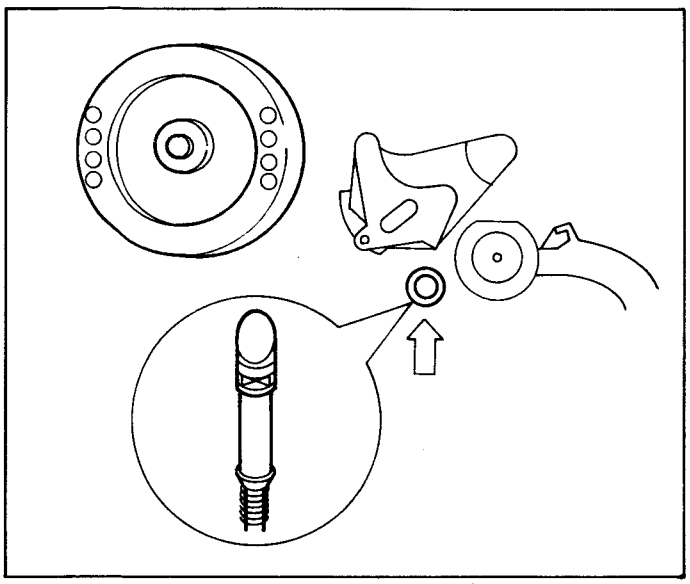


Fig. 16 Height Adjustment of Tape Guide Posts-(4)

7. HEIGHT ADJUSTMENT OF PULL OUT POST

Notes:

1. The adjustment should be performed after the adjustment of P4 as the spec. is based on height of P4.
2. The adjustment should be performed in the Loading completion mode.
3. Before this adjustment, simulate the cassette down condition without cassette tape.

(A) In Case of Front Loading Type VCR

(1) Remove the cassette compartment. Do not disconnect the connection cable from the Cassette Loading Motor.
(2) Insert a cassette tape into the cassette compartment.

(B) In Case of Top Loading Type VCR

(1) Remove the cassette compartment, and cover the take up and supply photo transistors with black tape. Press the Lock Lever (B) until the cassette down condition as shown below.

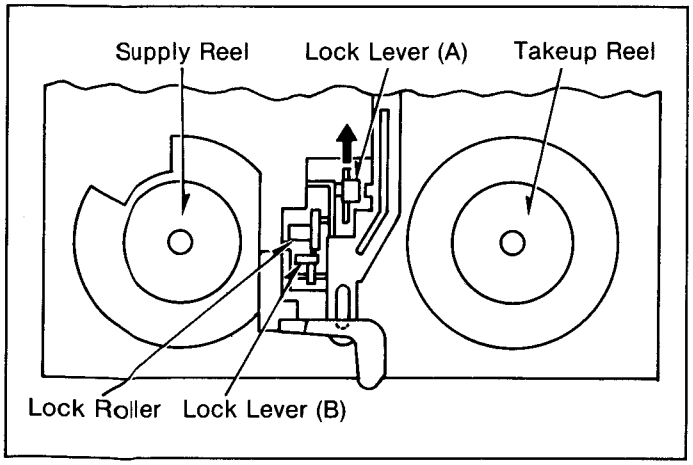


Fig. 17 Cassette Down Condition Without Cassette Tape

(2) After this adjustment is finished, return the Lock Lever (B) to Eject position as described below.
(3) How to return Eject position. Pull up the Lock Lever (A) as direction indicated by the arrow shown in Fig. 17.

Equipment Required:

Post Adjustment Plate
Reel Table Height Gauge
Nut Driver (5.5mm) .....Purchase Locally

Specification: 0mm

1. Push the play button for loading.
2. As soon as loading is completed, disconnect the AC plug and remove the cassette up holder.
3. Place the post adjustment plate, put the reel table height gauge on the plate and set height gauge to zero with condition the foot touches on the height adjustment plate.

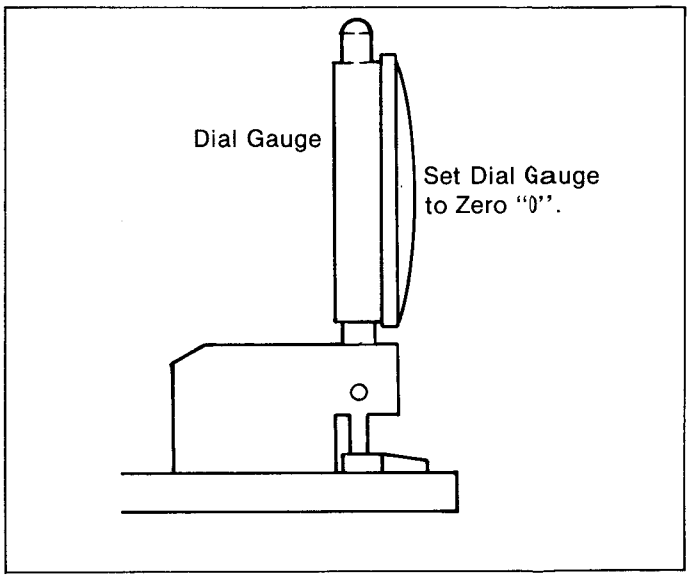


Fig. 18

4. Slightly lower the post by turning the nut clockwise. Place the foot to the post as shown.
5. Then slowly turn the nut till the gauge reads the specified height.

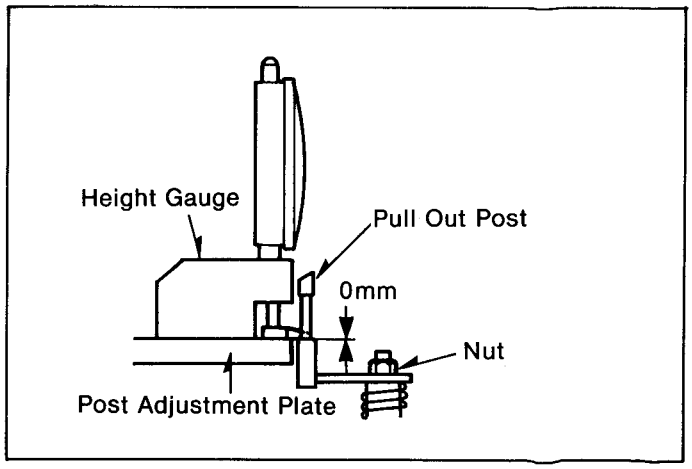


Fig. 19 Height Adjustment of Pull Out Post

6. Reinstall the cassette compartment.
7. Play back a normal cassette tape and make sure that the edges of the tape are not curling against the edge of the posts P1, P2, P3, P4 and pull out post as shown in Fig. 20.

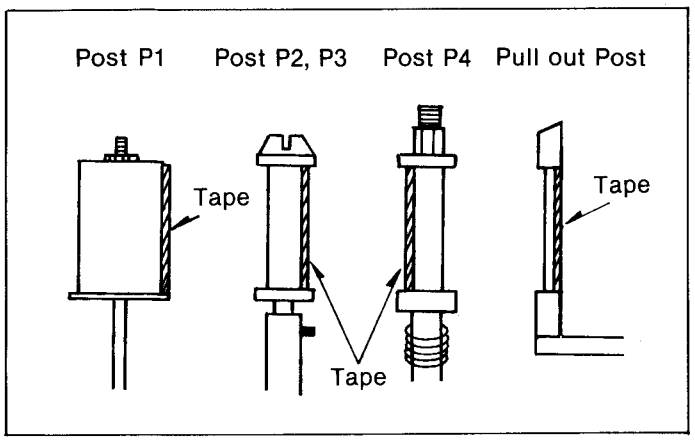


Fig. 20

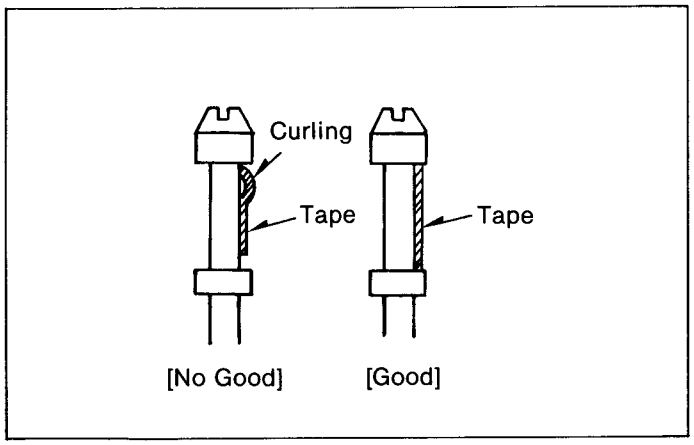


Fig. 21

8. If curling appears, readjust each post.

8. TAPE INTERCHANGEABILITY ADJUSTMENT

Note:

To perform these adjustment/confirmation procedures, make sure that the tracking control is set into the detent (fixed) position.

Equipment Required:

Alignment Tape
Post Adjustment Screwdriver
H-Position Adjustment Screwdriver
Hex. Wrench (0.9mm)
Nut Driver (5.5mm)

8-1. Confirmation/Adjustment of Envelope Output

1. Connect the oscilloscope to the output of the Head Amp as shown below.

Note:

Head Amp output and the head switching pulse input for triggering the oscilloscope are shown in the Luminance Process Block Diagram of the VTR Service Manual.

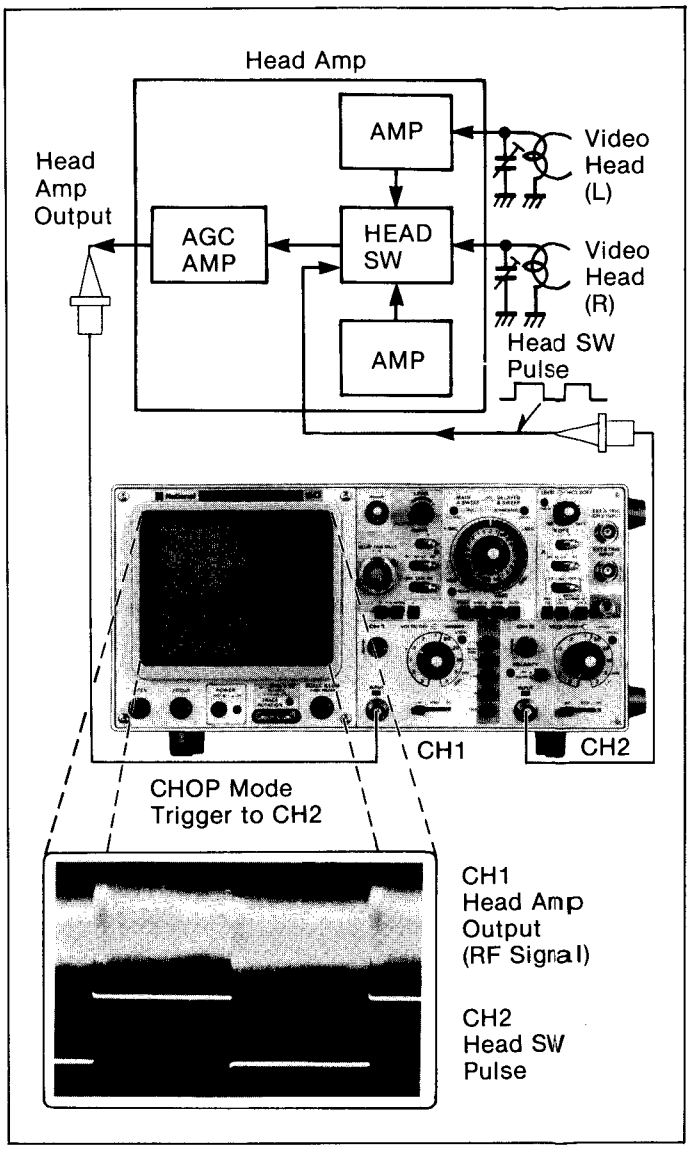


Fig. 22 Connection of Oscilloscope

2. Playback the monoscope portion of the alignment tape and adjust posts P2 and P3 while watching the scope display so that RF envelope on the scope becomes as flat as possible.

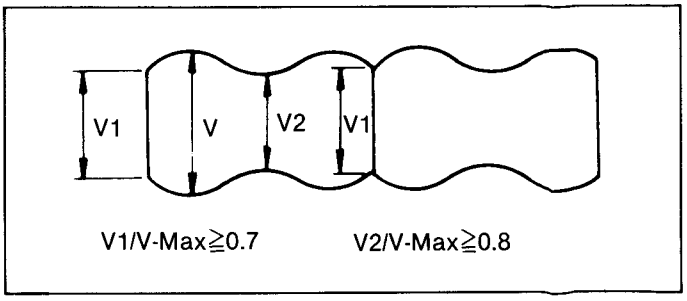


Fig. 23 Confirmation of Envelope Output

3. If the scope display is as follows, adjust the height of P2 shown in Fig. 13.

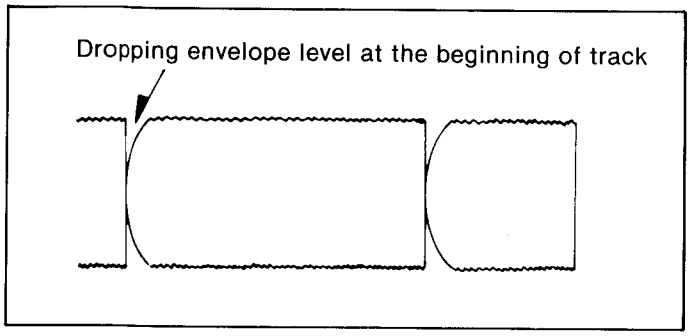


Fig. 24 Adjustment of Envelope Output-(1)

4. If the scope display is as follows, adjust the height of P3 shown in Fig. 13.

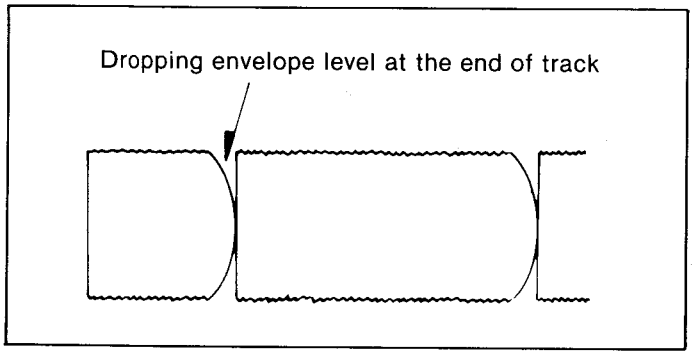


Fig. 25 Adjustment of Envelope Output-(2)

5. When P2 and P3 posts are adjusted correctly the scope display becomes as shown below.

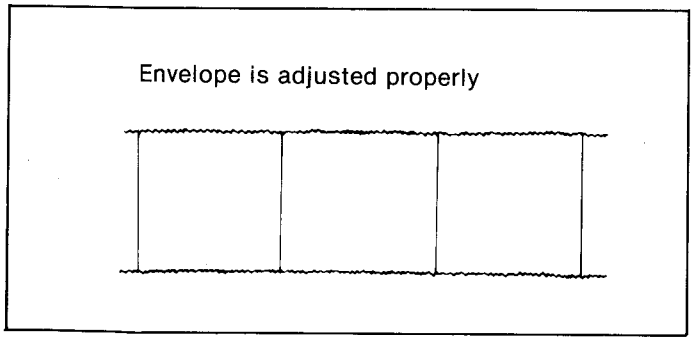


Fig. 26 Adjustment of Envelope Output-(3)

6. When adjustment is required, turn slowly and wait for servo lock. Be sure the tape travels over the post as shown.

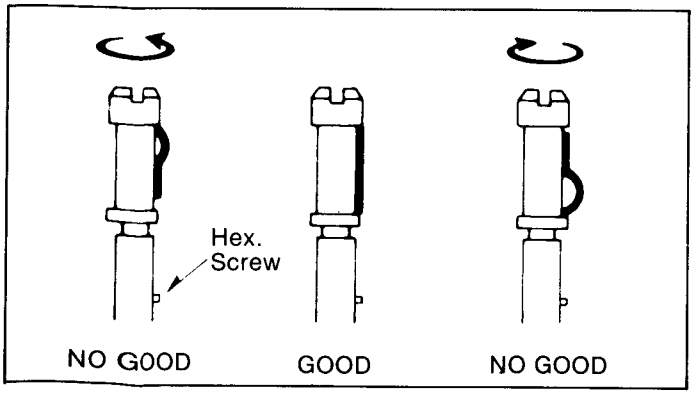


Fig. 27 Adjustment of Envelope Output-(4)

8-2. Confirmation of A/C Head Height

Note:

Unless the A/C Head is replaced, this procedure should not be performed.

1. Looking at the lower edge of the control head with the tape running, ensure that the lower edge of the tape runs along the lower edge of the control head. If it doesn't, slightly turn the nut (A) in either direction to correct. Clockwise to lower the head and counterclockwise to raise it.

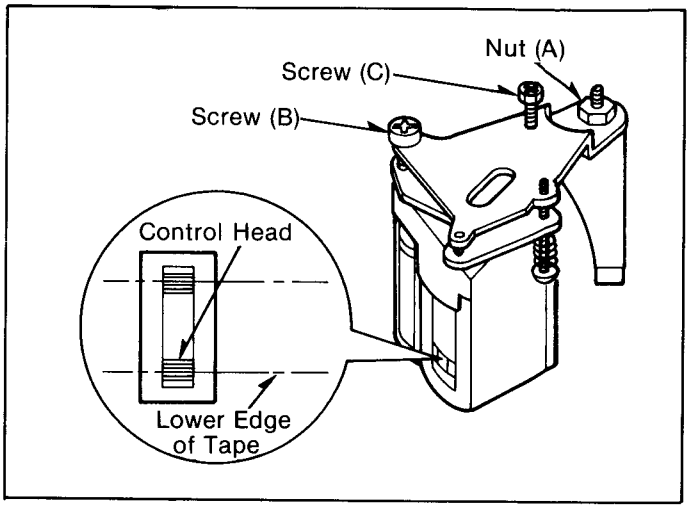


Fig. 28 Confirmation of A/C Head Height

8-3. Confirmation of Tilt of A/C Head

This procedure should be performed after the height adjustment of P4.

1. Play back the tape and confirm the tape runs between lower and top limiters of post. And confirm the condition of tape running.
2. If the adjustment is required, turn counterclockwise the screw (C) so that the curling is apparent with lower edge of P4. Then turn clockwise the screw (C) so that the curling is smooth out.

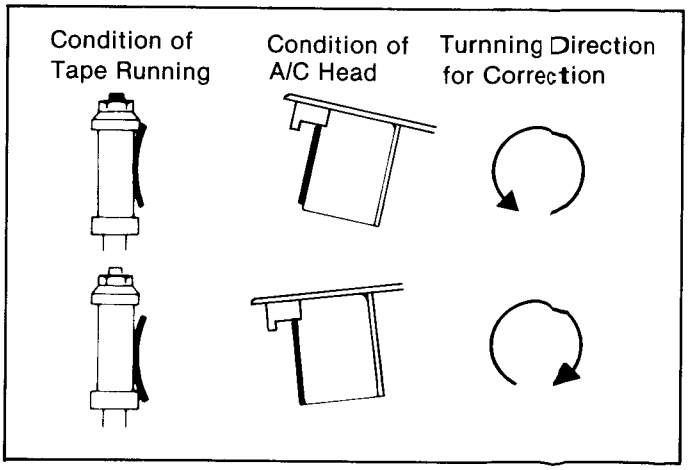


Fig. 29 Confirmation of Tilt of A/C Head

8-4. Adjustment of A/C Head Height and Azimuth

(A) Procedure for Mono A/C Head

1. Connect the oscilloscope to the Audio Output on the right side of the deck.
2. Play back the monoscope portion (6kHz, Mono) of the alignment tape.

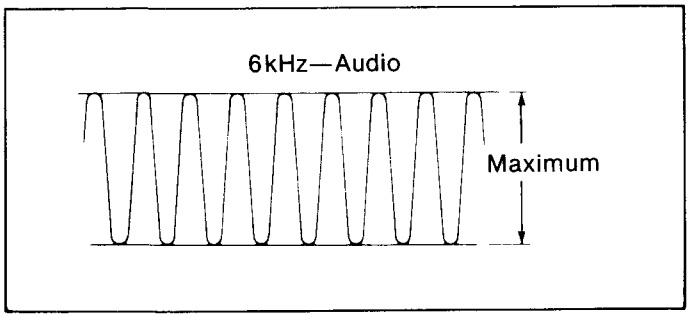


Fig. 30 Adjustment of A/C Head Height and Azimuth

3. Adjust the screw (B) on the head base so the output level becomes maximum.

(B) Procedure for Stereo A/C Head

1. Set the Audio Select Switch to L + R position.
2. Connect the Audio Output Cord (VJPS0069) to the Audio Output on the right side of the deck.
3. Connect the oscilloscope CH1 to the Audio Output Cord (Left), and CH2 to the Audio Output Cord (Right).
4. Playback the color bar portion (3kHz, Stereo) of the alignment tape.
5. Adjust the screw (B) so that the CH2 envelope is maximized.

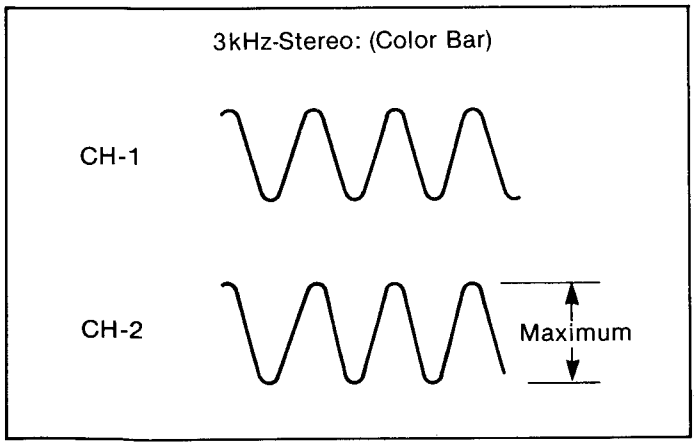


Fig. 31 Adjustment of A/C Head Height and Azimuth-(1)

6. Then, adjust the nut (A) so that the CH2 envelope is maximized.

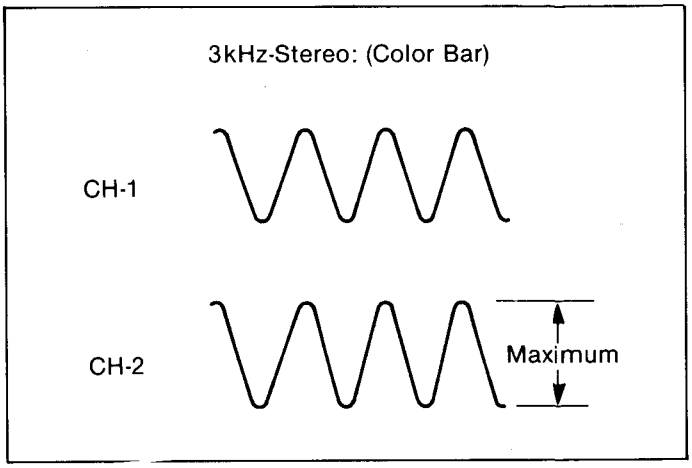


Fig. 32 Adjustment of A/C Head Height and Azimuth-(2)

7. Playback the monoscope portion (6kHz, Monaural) of the alignment tape.
8. Then, adjust the screw (B) so that the phases of the both channels are matches as shown below.

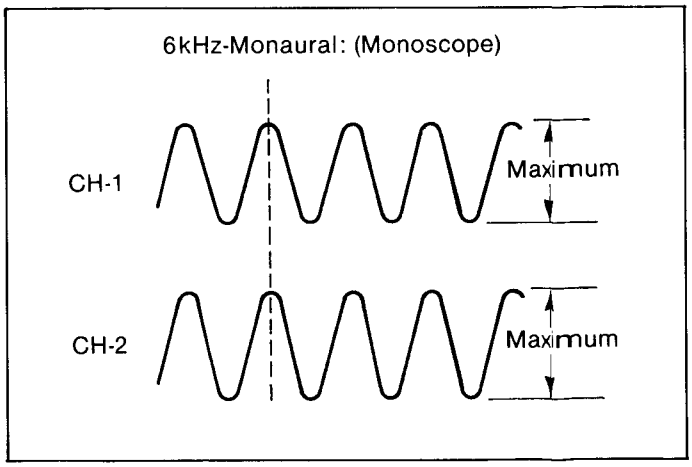


Fig. 33 Adjustment of A/C Head Height and Azimuth-(3)

Note:

During this adjustment, the audio output level should be maximum.

8-5. Horizontal Position Adjustment of A/C Head

1. Set the tracking control to the detent (fixed) portion. Connect the oscilloscope to the output of the Head Amp. Refer to Fig. 22 "Connection of oscilloscope".
2. Playback the monoscope portion of the alignment tape and confirm the RF signal envelope figure.
3. If adjustment is required, insert an H-position adjustment screwdriver into the Adjustment Nut.
4. Slowly turn the Adjustment Nut clockwise until the envelope output is maximized.

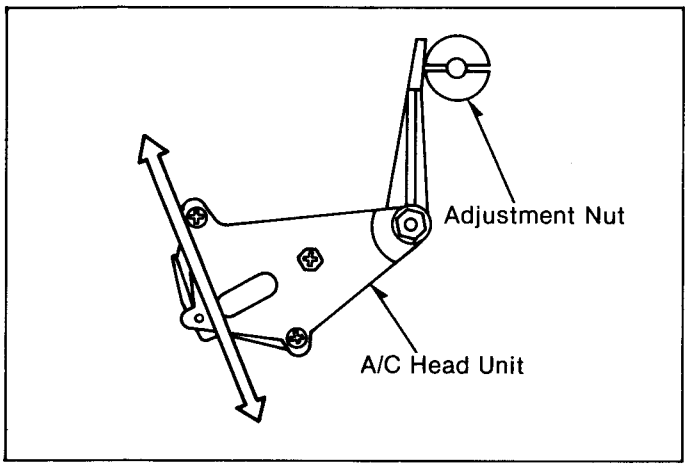


Fig. 34 Horizontal Position Adjustment of A/C Head

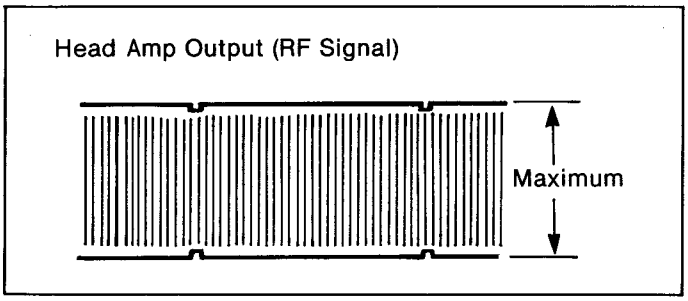


Fig. 35

9. ADJUSTMENT OF F.G. HEAD GAP

Specification: 0.18 (±0.02)mm

1. Slightly loosen the 2 screws.
2. Hold the F.G Head Unit with your fingers, and adjust the gap as specified.
3. After adjustment, tighten 2 screws.

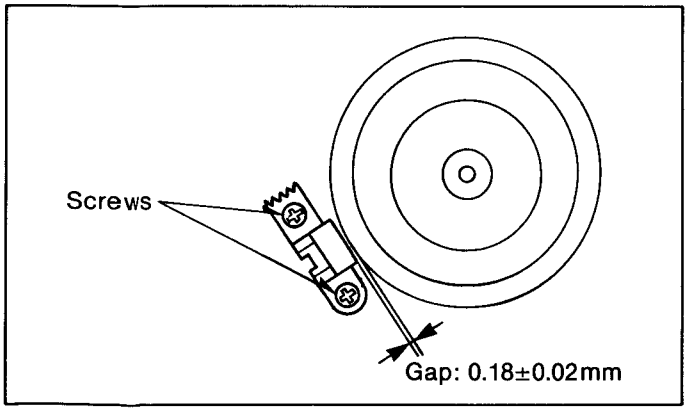


Fig. 36 Adjustment of FG. Head Gap

Note:

Do not flaw the F.G. Head or outside surface of the rotor.

10. ASSEMBLY AND ADJUSTMENT OF GEARS AND ROD

GENERAL CONDITION

The mechanism of this model is mostly engaged to the System Control Circuit, through the mode select switch.
Therefore the relation between the mode select switch and the cam gear decides all further mechanical movement of the mechanical parts such as levers, gears, rollers and so on.
If the adjustment of this item is performed improperly, the deck will be unloaded or compulsorily stopped.
And it will result being damaged at any mechanical or electrical parts.

A. ADJUSTMENT OF LOADING ARM

1. Install the supply and takeup loading arm units so that the projection (A) on the takeup loading gear aligns with the projection (B) on the supply loading gear.
   Then install the 2 retaining rings on the supply loading gear and on the takeup loading gear.
   Ensure that the loading arm units are still in the fully unloading condition.

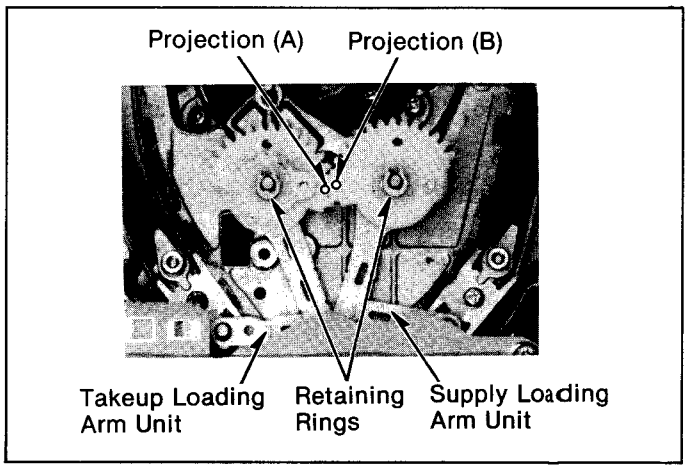


Fig. 37 Assembly and Adjustment of Gears and Rod-(1)

Note:

Pay attention that the washers are remaining under the loading gears.

B. ADJUSTMENT OF CAM GEAR

1. Make sure the position of Loading Arm as Fig. 38 before proceduring this adjustment.
2. Install the cam gear so that the hole on the cam gear meets the hole on the chassis. Then install the retaining ring.

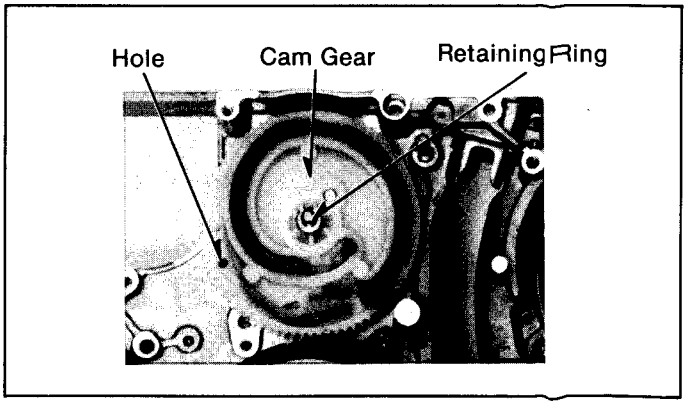


Fig. 38 Assembly and Adjustment of Gears and Rod-(2)

3. Install the lock arm as shown in Fig. 39. Then install the retaining ring and the washer.

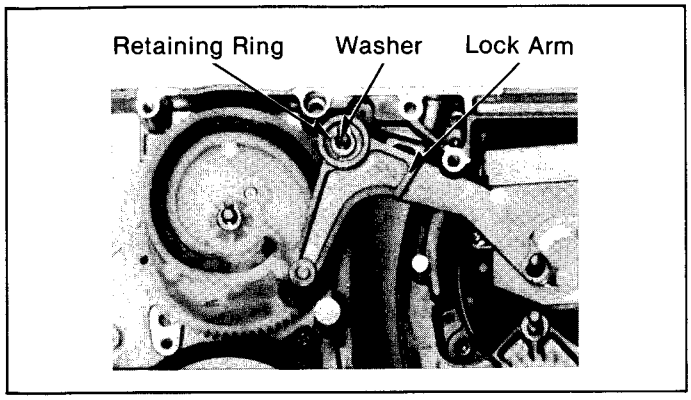


Fig. 39 Assembly and Adjustment of Gears and Rod-(3)

Note:

Pay attention that the washer is remaining under the lock arm.

C. ADJUSTMENT OF LOCK GEAR

1. Perform the adjustment after making sure the mechanism position that is described in previous item A and B.
2. Install the lock gear so that the projection (C) on the lock gear aligns with the projection (D) on the takeup loading gear.

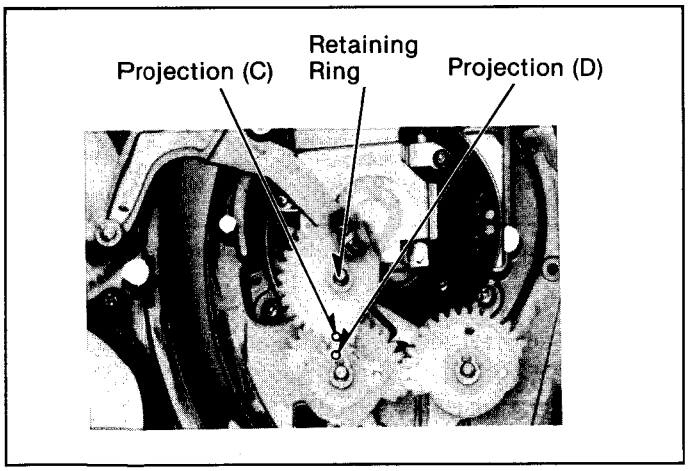


Fig. 40 Assembly and Adjustment of Gears and Rod-(4)

3. Install the support plate with the screw.

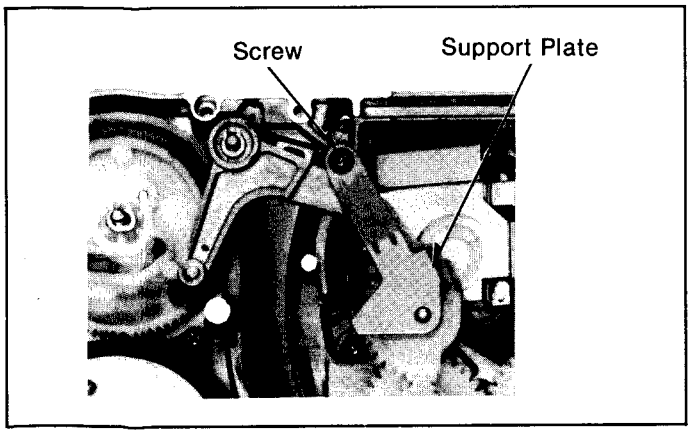


Fig. 41 Assembly and Adjustment of Gears and Rod-(5)

D. ADJUSTMENT OF MODE SELECT SWITCH

1. Perform this adjustment after making sure the mechanism position that is described in previous item A, B and C.
2. Rotate the gear on the mode select switch so that it is in click (dentent) position. Then install the mode select switch so that the delta hole (E) on the rotary switch gear aligns with the projection (F) on the cam gear, and install the 2 screws.

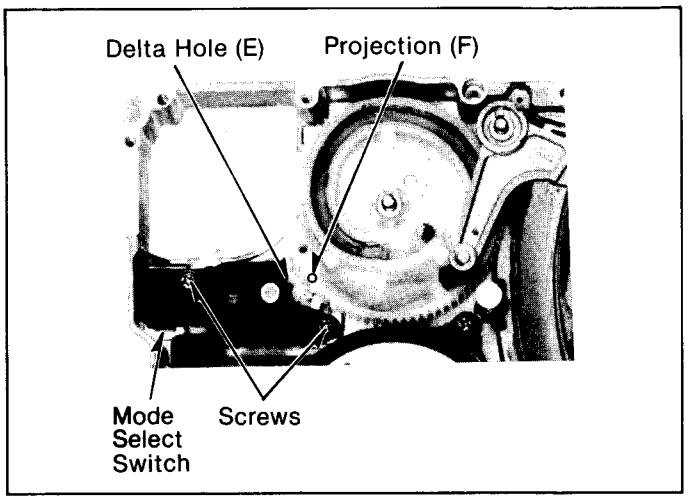


Fig. 42 Assembly and Adjustment of Gears and Rod-(6)

Note:

There is one click point per 4 rotations.

3. Install the loading motor with 2 screws.

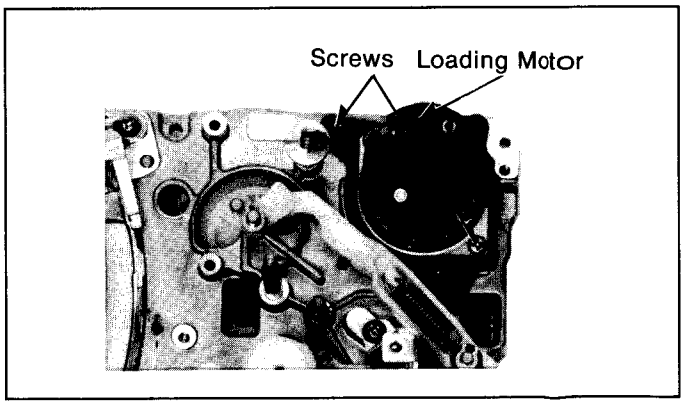


Fig. 43 Assembly and Adjustment of Gears and Rod-(7)

4. Confirm the cam gear is in the EJECT condition.

E. ASSEMBLY PROCEDURE OF MAIN ROD, BRAKE ARM, BRAKE CAM GEAR

1. Perform the assembly after making sure the mechanism position that is described in previous item A, B, C, and D.
2. Install the main rod so that the hole on the main rod meets the hole on the chassis. Then install the brake arm, the brake cam gear, the washer and the 3 retaining rings.

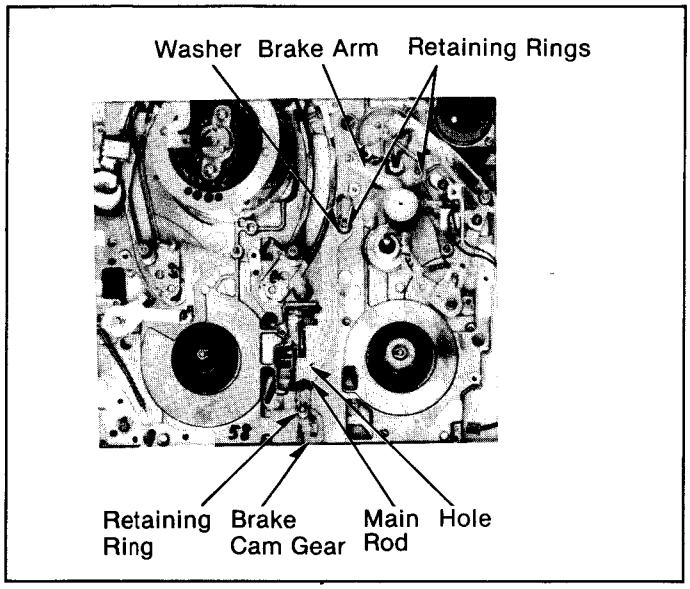


Fig. 44 Assembly and Adjustment of Gears and Rod-(8)

11. ADJUSTMENT OF LEAF SWITCH

Note:

This adjustment for Top Loading VCR only.

Equipment Required:

Fine Adjustment Screwdriver

Specification: 0.9mm~1.3mm

1. Remove the DD Reel Unit from the chassis.
2. Slightly loosen a screw (A) and insert the Fine Adjustment Screwdriver to the Hole (B).
3. By rotating the Fine Adjustment Screwdriver, adjust the leaf switch so that gap (C) is 0 and the gap (D) between the upper and lower plates of the leaf switch is 0.9mm to 1.3mm, and tighten screw (A).
4. Install the DD Reel Unit.

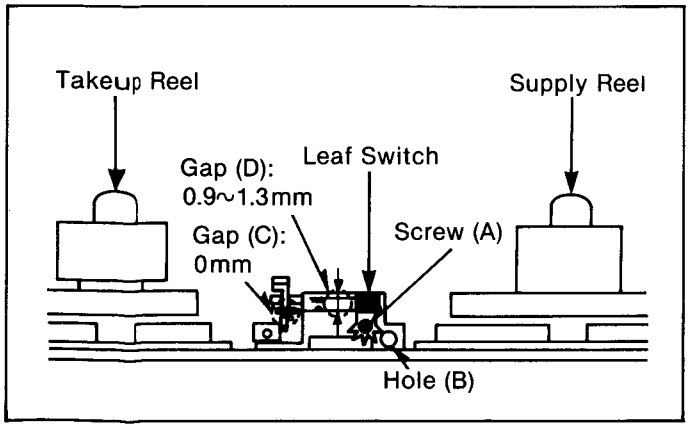


Fig. 45 Adjustment of Leaf Switch

Note:

After adjustment, confirm that the leaf switch turns On when the Cassette Up Unit is pressed down, and turns Off when the Cassette Up Unit is raised.

12. POSITION ADJUSTMENT OF RECORDING SAFETY SWITCH

Note:

This adjustment Top Loading VCR only.

Equipment Required:

Cassette Holder Fixture
Fine Adjustment Screwdriver

1. Place the fixture in place over the reel tables.
2. Confirm Rec. Safety Switch position is just turned ON.
3. When Rec. Safety Switch position is not right, remove the fixture and loosen a screw (A).
4. Insert the fine adjustment screwdriver into the hole (B), and adjust the position. Then tighten the screw (A).
5. Reinstall the fixture and confirm again.

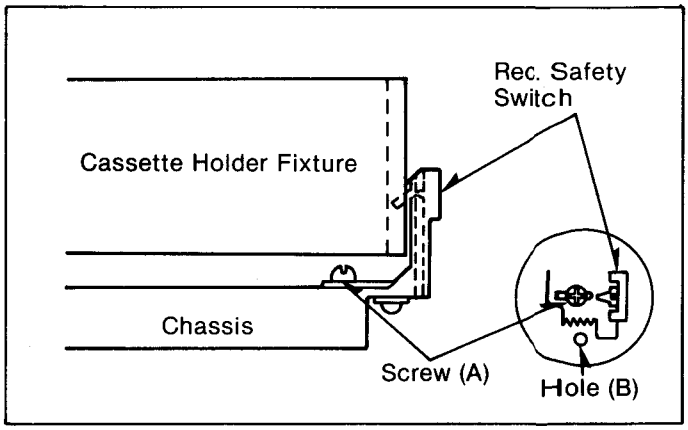


Fig. 46 Position Adjustment of Recording Safety Switch-(1)

Note:

When cassette with a safety tab is used, the Rec Safety switch Turns on and without a tab, it opens.

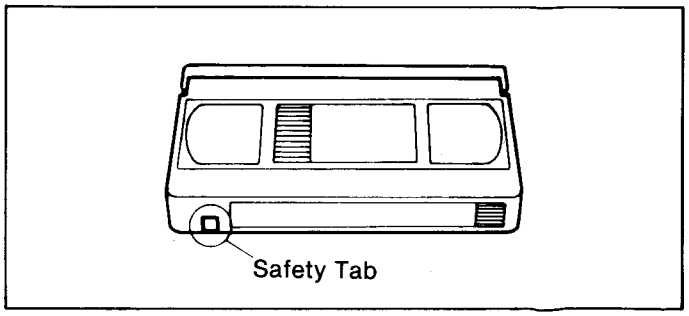
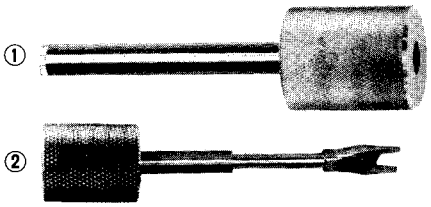


Fig. 47 Position Adjustment of Recording Safety Switch-(2)

Servicing Fixtures & Tools

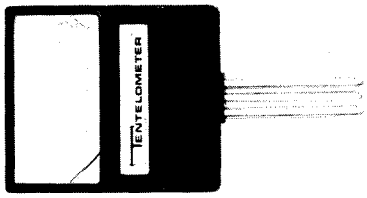
VFMS0001H6 VHS Alignment Tape

① **VFK0137** Post Adj. Screwdriver
② **VFK0003** H-Position Adj. Fixture

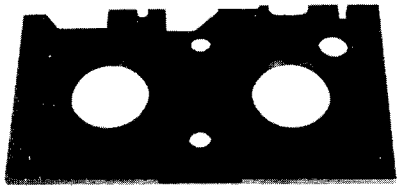


VFK0136 Fine Adjustment Screwdriver (3mmϕ)

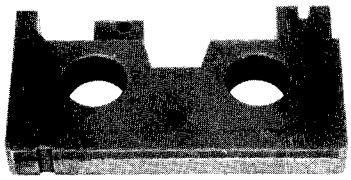
Back Tension Meter
(Tentelometer, Made in U.S.A.)



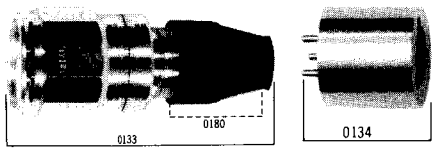
VFKS0010 Post Adjustment Plate



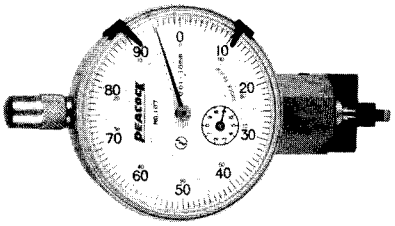
VFKS0017 Cassette Holder Fixture



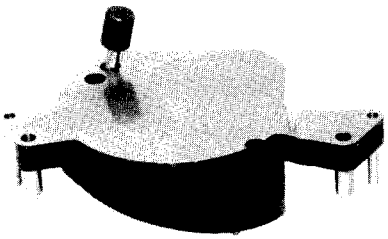
VFK0133 Dial Torque Gauge
VFK0180 (Plastic Clamper Only)
VFK0134 Adaptor for VFKS0133



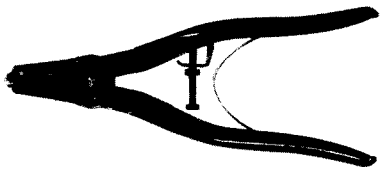
VFKS0009 Reel Table Height Fixture



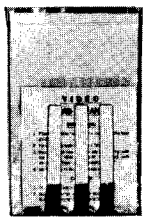
VFKS0034 V-Stopper Adj Fixture



VFK0144 Retaining Ring Remover (3mmϕ)



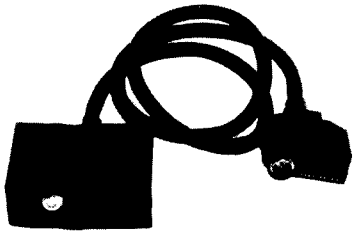
VFK27 Head Cleaning Stick



MOR265 Morlytone Grease

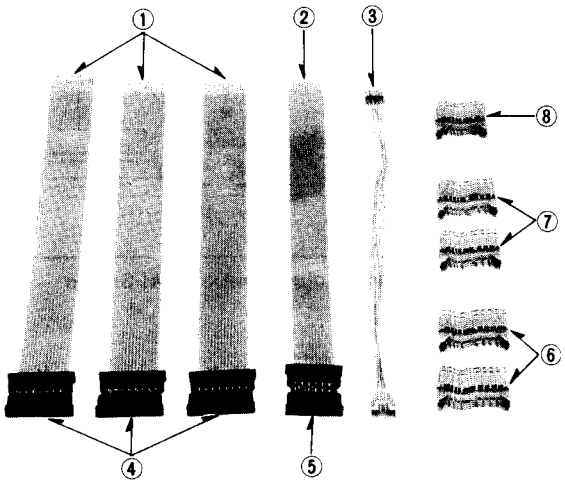
VFK0146 Hex. Wrench (0.9mm)

VFKS0043 Multi Extension Cable



VFKS0035 Extension Cable Kit

① **VFKS0036** Extension Cable (A)
② **VFKS0037** Extension Cable (B)
③ **VFKS0042** Extension Cable (C)
④ **VFKS0038** Extension Connector (A)
⑤ **VFKS0039** Extension Connector (B)
⑥ **VFKS0040** Extension Connector (C)
⑦ **VFKS0041** Extension Connector (D)
⑧ **VFKS0044** Extension Connector (E)



ELECTRICAL ADJUSTMENT PROCEDURES

1. TEST EQUIPMENT

To perform the electrical adjustments completely, the following equipments are required.

1. DVM (Digital Voltage Meter)
   Voltage Range: 0.001~50V
2. Regulated DC Power Supply Voltage:
   0~12V DC
3. Dual-trace Oscilloscope
   Voltage Range: 0.05~50V/Div.
   Frequency Range: DC~10MHz
   Probes: 10:1, 1:1
4. Frequency Counter
   Frequency Range: 0~10MHz
5. Signal Generator
   Sinewave: 0~10MHz
6. Sweep Generator
   Frequency Range: 0~10MHz
7. Color TV Receiver or Monitor
8. Plastic Tip Driver
9. VHS Alignment Tape: VFMS0001H6
10. AC Millivolt Meter: 0~3mVrms

2. ADJUSTMENT PROCEDURES

Note:

Components and Test Points in each section are series numbers. But for, easy alignment only the last numbers are used on P.C. Board.

These adjustment procedures consist of the following sections.

	SERIES
1. A.V.R Section	1000
2. System Control Section	6000
3. Servo Section	2000
4. Audio Section	4000
5. Video Section	
Luminance	3000
6. Main Section	
Drive	2500
Jack	6900
7. Wired Remote Control Unit Section	

2-1. A.V.R Section

2-1-1. +9.5V and +5V Regulator Adjustment

Test Points: TP1001, TP1002
Adjustments: R1025 (+9.5V), R1014 (+5V)

1. Connect the Multi-connector to the deck so that +12V is supplied to the deck.
2. Place the unit in STOP mode.
3. Connect the DVM to TP1001 on the A.V.R section.
4. Adjust the +9.5V (R1025) so that the voltage at TP1001 is 9.5 (+−0.05)V DC.
5. Connect the DVM to TP1002 on the same section.
6. Adjust the +5V (R1014) so that the voltage at TP1002 is 5.1 (+−0.05)V DC.
7. Remove the DVM.

2-2. System Control Section

2-2-1. Under Cut Adjustment

Test Point: TP6001
Adjustment: R6049 (UNDER CUT)

1. Don't connect the Multi-connector to the deck.
2. Turn the UNDER CUT (R6049) counter-clockwise.
3. Connect a Regulated DC Power Supply and DVM to the battery terminal on the deck.
4. Adjust the Regulated DC power Supply so that the voltage is 10.35 (+−0.03)V DC.

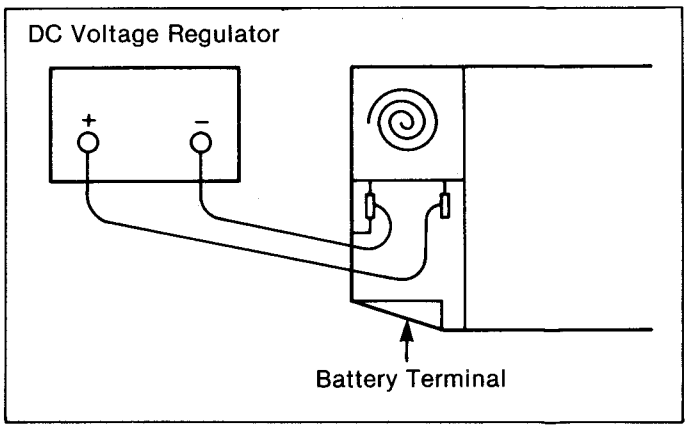


Fig. E1

5. Turn the Deck Power Switch ON.
6. Then slowly turn the UNDER CUT (R6049) on the System Control section clockwise until the "EB" mark is indicated (flashing) on the LCD counter for three seconds and the deck is placed in the OFF mode.
   Confirm that the Deck Power Switch is automatically turned OFF.
7. Adjust the DC Voltage to 10.50 (+0, −0.05)V DC.
8. Turn the Deck Power Switch ON.
9. Confirm that the Deck Power Switch is not automatically turned OFF.

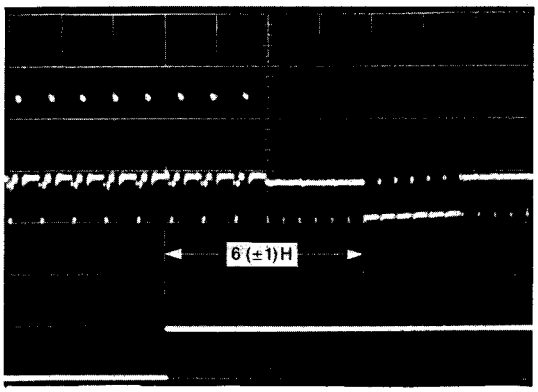
2-3. Servo Section

2-3-1. Head Switching Position Adjustment

Test Points: TP2004, TP3004
Adjustment: R2065 (PG SHIFT)

1. Connect the Multi-connector to the deck so that +12V is supplied to the deck.
2. Play back the color bar section of alignment tape.
3. Connect the scope CH1 to TP3004 on the Luminance section and CH2 to TP2004 on the Servo section.
4. Set the scope to the CHOP mode.
5. Also set the scope to the DELAY mode or expand the vertical interval of the signal from TP3004.

6. Adjust the PG SHIFT (R2065) so that the playback head switching point is 6(+−1)H before the start of vertical sync as shown below.



TP3004 1V/0.1msec. div.
TP2004 5V/0.1msec. div.

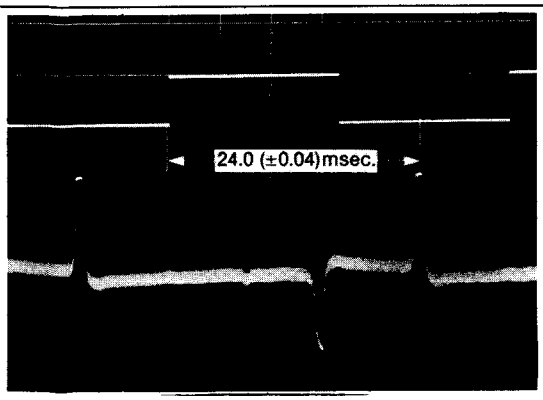
Fig. E2

7. Change the slope selector on the scope from "+" to "−" and make sure that the other switching point is also 6±1H before the beginning of vertical sync.

2-3-2. Tracking Control Adjustment

Test Points: TP2002, TP2004
Adjustment: R2066 (TRACKING FIX)

1. Connect the Multi-connector to the deck and supply a video signal on the right side panel or tune in a local on-air TV program.
2. Set the tracking control on the front panel to the center position.
3. Insert a cassette and make a recording in the SP mode for a few minutes.
4. Play back the portion just recorded.
5. Connect the scope CH1 to TP2004 and CH2 to TP2002 on the Servo section and expand sweep.
6. Adjust the TRACKING FIX (R2066) so the T period is 24.0 (+−0.04)msec.



TP2004 5V/5msec.
TP2002 1V/5msec.

Fig. E3

2-3-3. Slow Free Run Adjustment

Test Point: TP2001
Adjustment: R2067 (SLOW-FR)

1. Connect the Multi-connector to the deck and supply a video signal on the right side panel or tune in a local on-air TV program.
2. Insert a cassette and make a recording in the SLP mode.
3. Connect the jumper from TP2003 to GND and from TP2007 to GND.
4. Connect the frequency counter to TP2001 on the Servo section.
5. Adjust the SLOW-FR (R2067) so that the frequency is 360 (+−10)Hz.
6. Remove the frequency counter.

2-4. Audio Section

2-4-1. Bias Current Adjustment

Test Points: Audio Head Terminals (L, R)
Adjustments: C4055 (L CH, BIAS ADJ)
C4056 (R CH, BIAS ADJ)

1. Don't supply any audio signal to the AUDIO INPUT on the right side panel or through the Tuner Unit.
2. Insert a cassette and make a recording in the SP mode.
3. Connect the AC Millivolt Meter as shown Fig. E4.

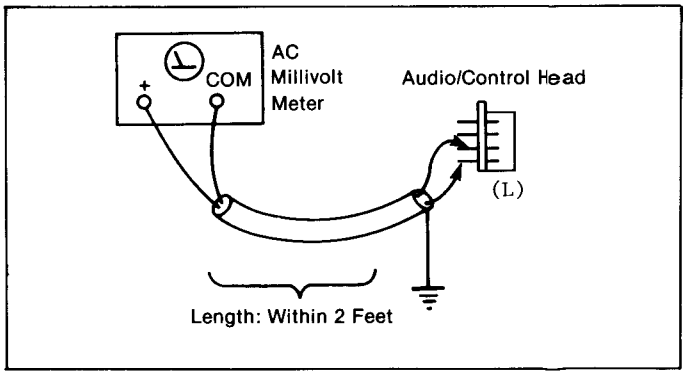


Fig. E4

4. While the recording is taking place, adjust the LCH BIAS ADJ (C4055) on the Audio section so that the voltage is 1.5 (+− 0.05)mVrms.
5. Change the connected point of the AC Millivolt Meter as shown Fig. E5.

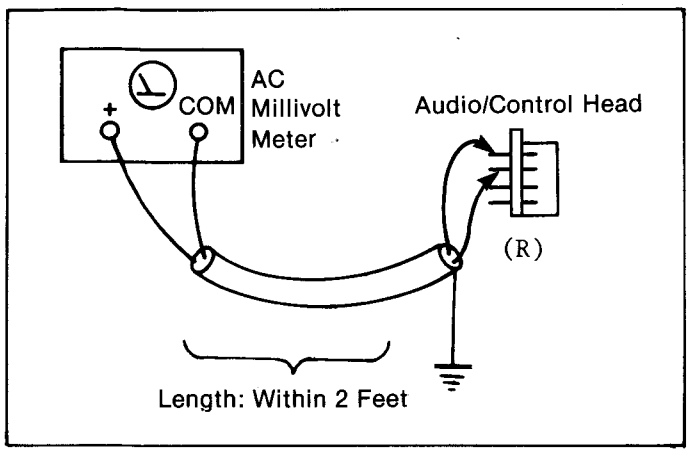


Fig. E5

6. During recording, adjust the R CH BIAS ADJ (C4056) on the Audio section so that the Voltage is 1.5 (+−0.05)mvrms.
7. Remove the AC Millivolt Meter.

2-4-2. Playback Gain Adjustment

Test Points: Audio Out Jacks (R, L)
Adjustments: R4004 (PB GAIN-L)
R4024 (PB GAIN-R)

1. Play back the Multi-Burst section (1kHz-Audio) or the alignment tape.
2. Connect the Audio output cord (Accessory: VJPS0069) to Earphone jack on the right side panel.
3. Connect dummy RCA plug to Audio out jacks(L CH and R CH) of the Audio output cord.
4. Connect the RCA pin to Video output jack.
5. Set the select switch to the STEREO position on the Audio output cord.
6. Connect the scope CH1 to Audio out jack (L) and CH2 to Audio out jack (R) of the Audio output cord as shown below.

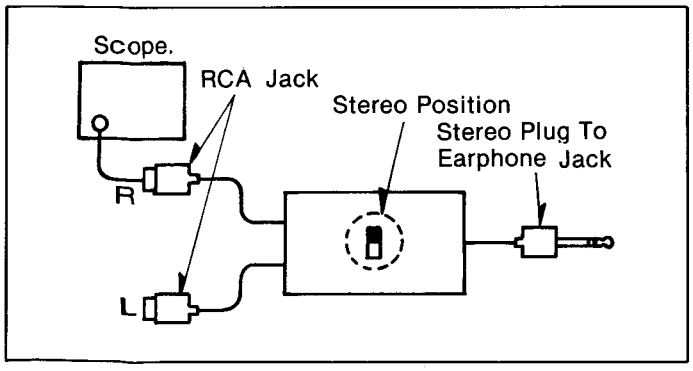


Fig. E6

7. Set the DOLBY NR Switch on the right side panel to OFF.
8. Set the scope to CH1 mode and adjust the PB GAIN-L (R4004) on the Audio section so that the level of the waveform is 300 (+−15)mVp-p.
9. Set the scope to CH2 mode and adjust the PB GAIN-R (R4024) on the Audio section so that the level of the waveform is 315 (+−15)mVp-p.

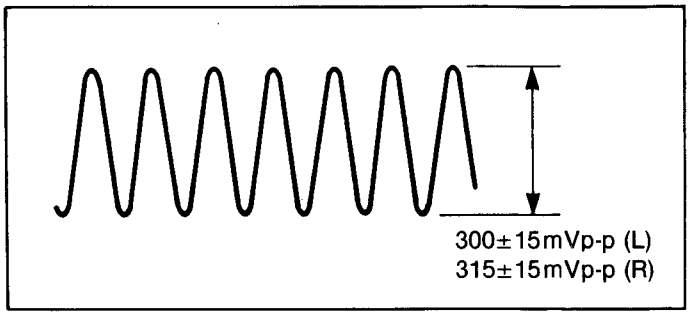


Fig. E7

2-4-3. Recording Gain Adjustment

Test Points: Audio Out Jacks (R, L) or TP4001, TP4002
Adjustments: R4008 (REC LEVEL-L)
R4028 (REC LEVEL-R)

(L Channel)

1. Supply a sinewave signal (1kHz, −10dB, 890mVp-p) to the MIC IN jacks(R and L) on the jack panel section, using the Stereo Line Adaptor (VJPS0068) as shown below.

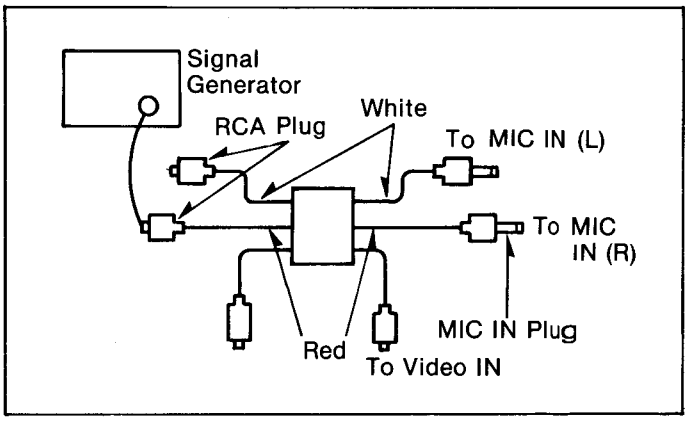


Fig. E8

2. Connect the RCA pin to the Video Output jack.
3. Place the unit in SP recording mode.
4. Connect the scope to TP4001 (L CH).
5. Playback the portion just recorded and read the level of the playback (TP4001).
6. Confirm that the Recording level and Playback level are the same.
7. If the Recording and Playback level are not the same, turn the REC LEVEL-L (R4008) slightly (either CW or CCW) so that levels are equal (CCW decreases the recording level and CW increases the recording level).
8. Repeat steps 5 and 6 a couple of times.
(This adjustment must be repeated until recording level and playback level are the same.)

(R Channel)

1. Repeat L Channel Adjustment of step 1 to 3.
2. Connect the scope to TP4002.
3. Playback the portion just recorded and read the level of the playback (TP4002).
4. Adjust the REC LEVEL-R (R4028), set the playback level higher than the recording level for 0.5dB.

2-5. Video Section

2-5-1. Recording Current Adjustment

Test Points: TP3002 (HOT), GND
Adjustment: R3001 (REC CURR)

1. Connect the Multi-connector to the deck and supply a color bar signal (1 Vp-p) to the video input on the right side panel.
2. Insert a cassette and make a recording in the SLP mode.
3. Connect the scope to TP3002 (HOT) and GND.
4. Turn the REC CURR (R3001) fully clockwise from foil side.
5. Confirm the chroma level at the same point is 45 (+−5) mVp-p.

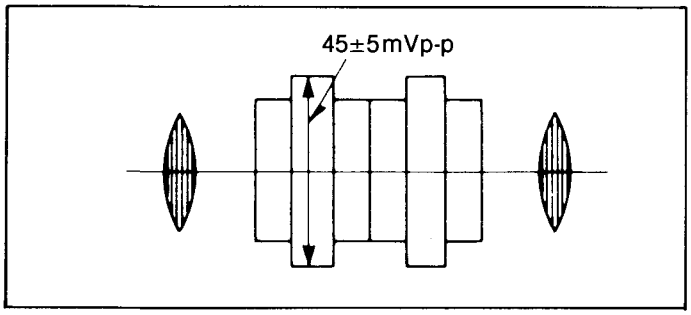


Fig. E9

6. Then slowly turn the REC CURR (R3001) on the Luminance section so that V sync portion of the envelope at TP3002 is 140 (+−3) mVp-p.

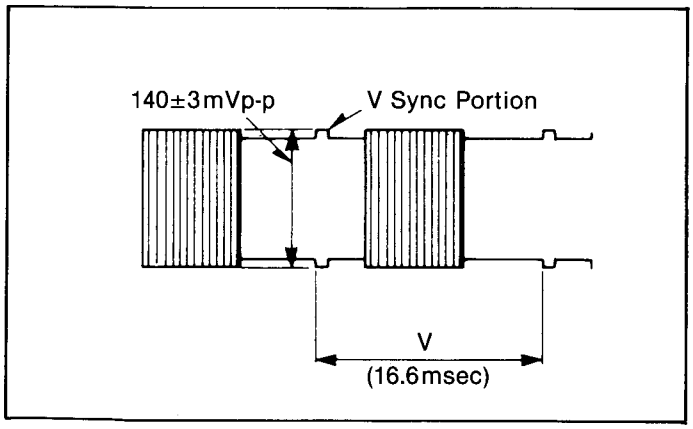


Fig. E10

2-6. Drive Section

2-6-1. V Lock Adjustment

Equipment: TV Monitor
Adjustments: R2536 (SLP), R2537 (SP)

1. Supply a color bar signal to the Video Input on the right side panel or tune in a local TV program.
2. Insert a cassette and make a recording in the SLP mode a few minutes.
3. Play back the portion just recorded, and push the Slow button.
4. Turn the Slow tracking VR for best picture on the TV screen.
5. Place the unit in PAUSE/STILL mode.
6. Adjust the V-LOCK-SLP (R2536) so that the center of picture is most stable.
7. Insert a cassette and make a recording in the SP mode a few minutes.
8. Play back the portion just recorded and push the PAUSE/STILL button.
9. Adjust the V-LOCK-SP (R2537) so that the center of the picture is most stable.

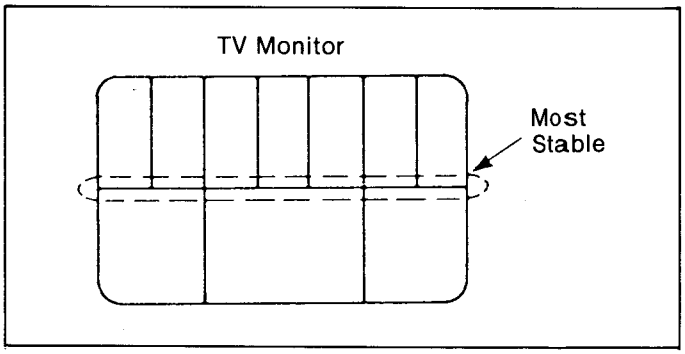


Fig. E11

2-6-2. Picture Control Adjustment

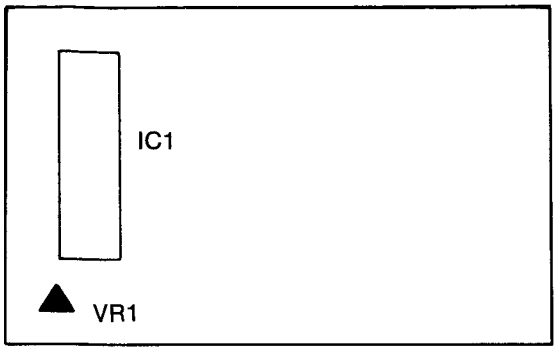
Test Point: TP3005
Adjustment: R6944

1. Supply a color bar signal to the right side panel.
2. Place the unit in stop mode and in the SP mode.
3. Connect the DVM to TP3005 on the Luminance section.
4. Adjust the PIC CTL (R6944) so that the voltage at TP3005 is 2.5 (+−0.1) V DC.
5. Remove the DVM.

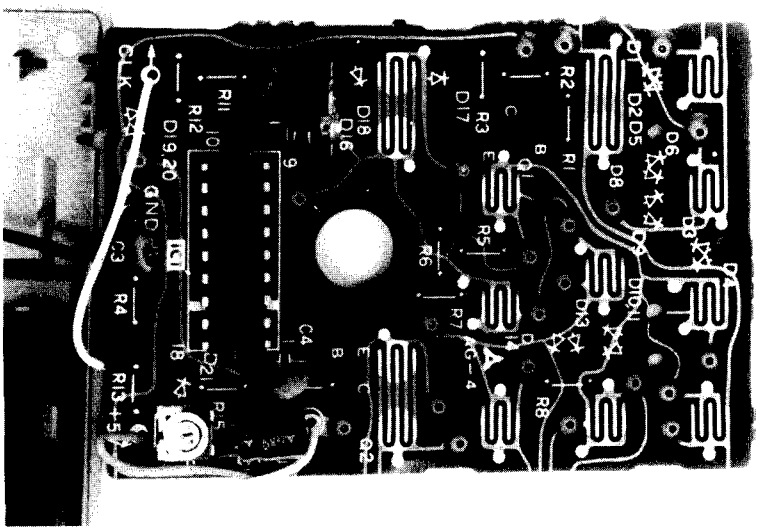
2-7. Wired Remote Control Unit Section

2-7-1. Microprocessor Clock Frequency Adjustment

1. Connect the WIRED REMOTE CONTROL UNIT to the deck.
2. Connect the frequency counter to pin 18 of IC1.
3. Adjust the VR1 so the frequency is 25+−0.2kHz.

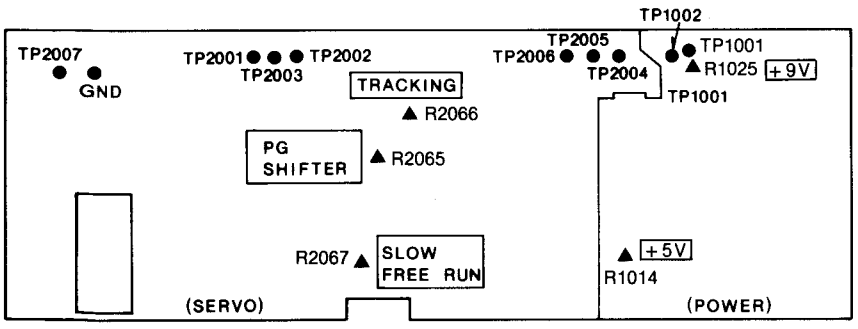


From Component Side

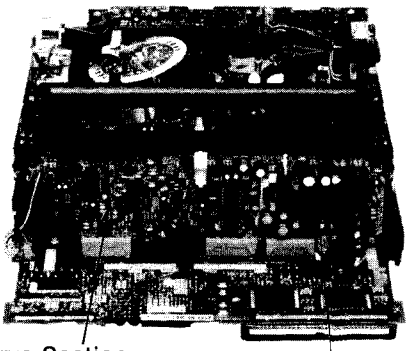


Location of Test Points and Adjustment Points

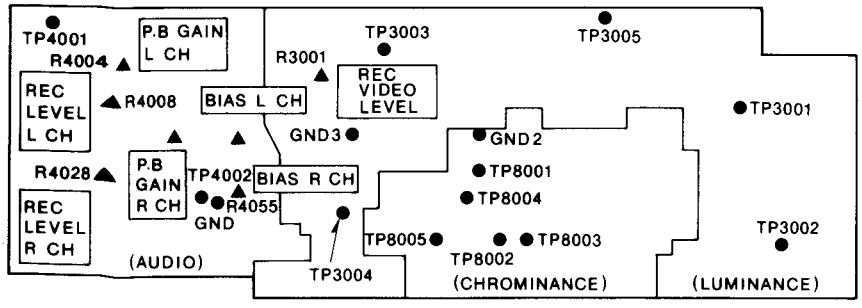
Servo & A.V.R C.B.A. VEPS0245A



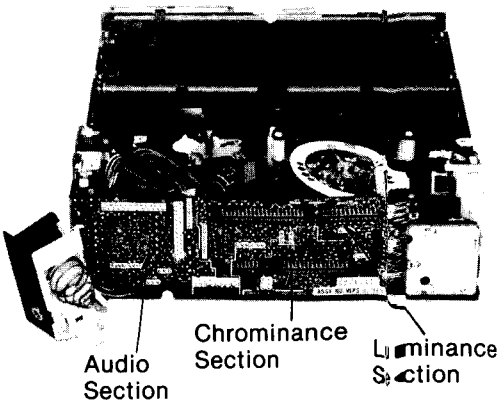
(Component Side)



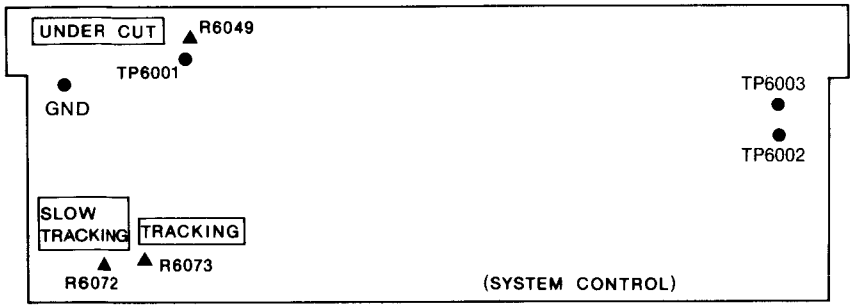
Luminance & Chrominance & Audio C.B.A. VEPS0334A



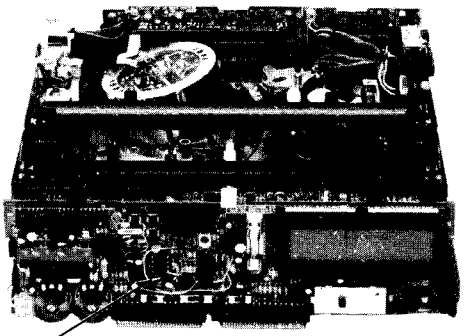
(Foil Side)



System Control C.B.A. VEPS0698A

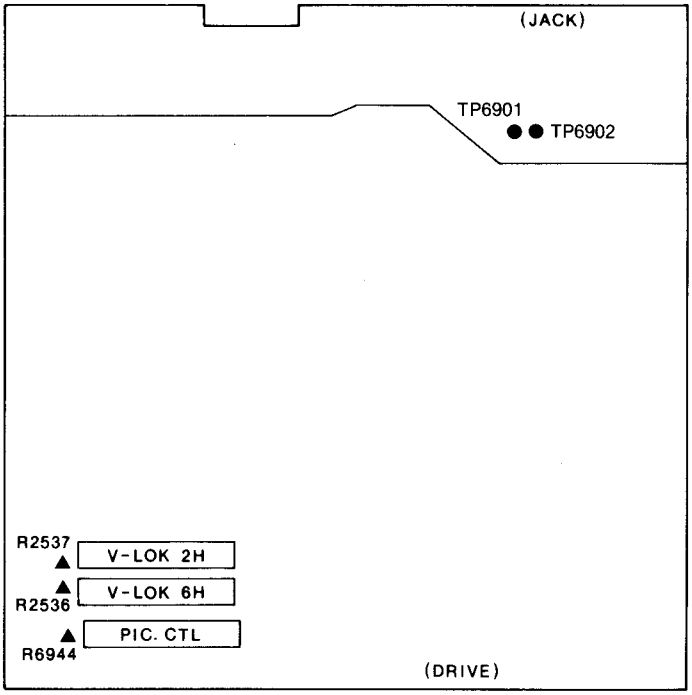


(Component Side)

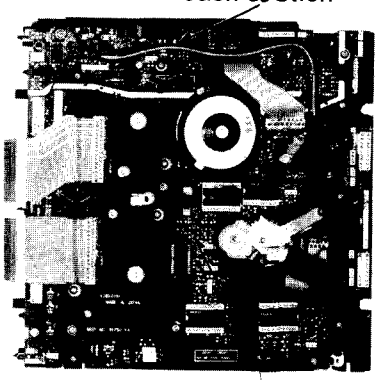


System Control C.B.A.

Main C.B.A. VEPS0244A



(Foil Side)



Jack Section

Drive Section

ORDER NO. VRD-8403-507

Service Manual

Video Cassette Recorder

Vol. 3

Panasonic Omnivision VHS

PV-8000

Block Diagrams

SPECIFICATIONS

Power Source:	12V DC Battery PV-BP80 Prog. Tuner Unit PV-A820 PV-A850 PV-A860 Plug-in AC Adaptor PV-A118
Power Consumption:	Approx. 10 watts (16W with Camera)
Television System:	EIA Standard (525 lines, 60 fields) NTSC color signal
Video Recording System:	4 rotary heads, helical scanning system Luminance: FM azimuth recording Color signal: Converted subcarrier phase shift recording
Audio Track:	2 track
Tape Format:	Tape width 1/2″ (12.7mm), high density tape
Tape Speed:	SP mode: 1-5/16 i.p.s. (33.35mm/s) LP mode: 21/32 i.p.s. (16.67mm/s) SLP mode: 7/16 i.p.s. (11.12mm/s)
Record/Playback Time:	8 HRS. with 160 min. type tape used in SLP mode
FF/REW Time:	Less than 6 min. with 120 min. type tape
Heads:	Video: 4 rotary heads Audio: 2 stationary heads Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing
Input Level:	Video: VIDEO IN Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack (Left, Right) −70dB, 4kΩ unbalanced
Output Level:	Video: VIDEO OUT Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack (RCA type) −9dB, 600Ω unbalanced RF Modulated: Ch3/Ch4 switchable, 72dBμ, (Open Voltage) 75Ω unbalanced
Video Horizontal Resolution:	Color: more than 230 lines B/W: more than 230 lines
Audio Frequency Response: (10dB down)	SP mode: 100Hz~8kHz LP mode: 100Hz~6kHz SLP mode: 150Hz~5kHz
Signal-to-Noise Ratio:	Video: SP mode: better than 41dB LP mode: better than 41dB SLP mode: better than 41dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB LP mode: better than 40dB SLP mode: better than 40dB
Operation Temperature:	32°F—104°F (0°C—40°C)
Operating Humidity:	10%—75%
Weight:	5.7 lbs. (2.6kg)
Dimensions:	8-7/16″(W)×2-3/4″(D)×10-3/8″(H) (215mm×69.5mm×263mm)

Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

Panasonic

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MC-Service

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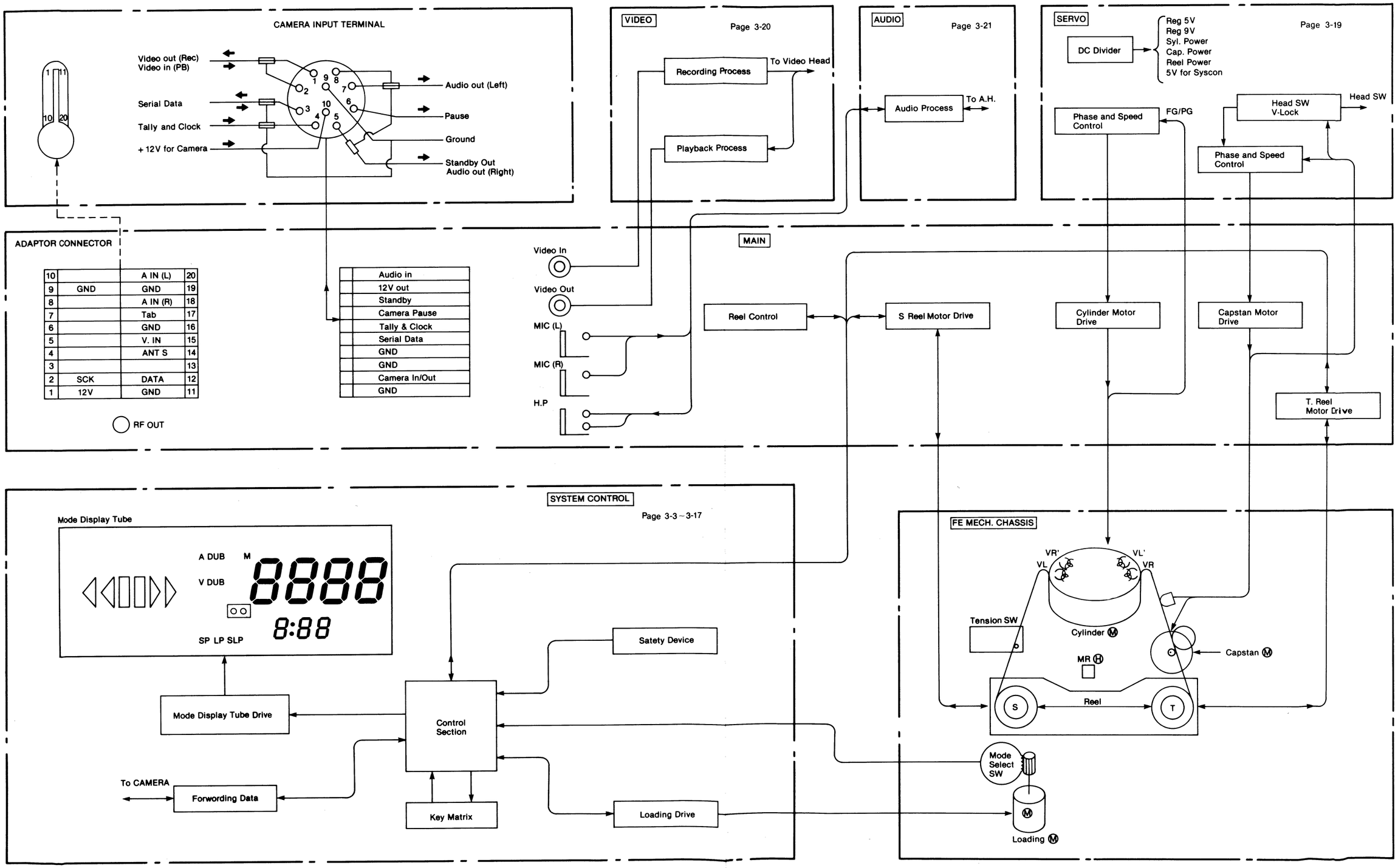
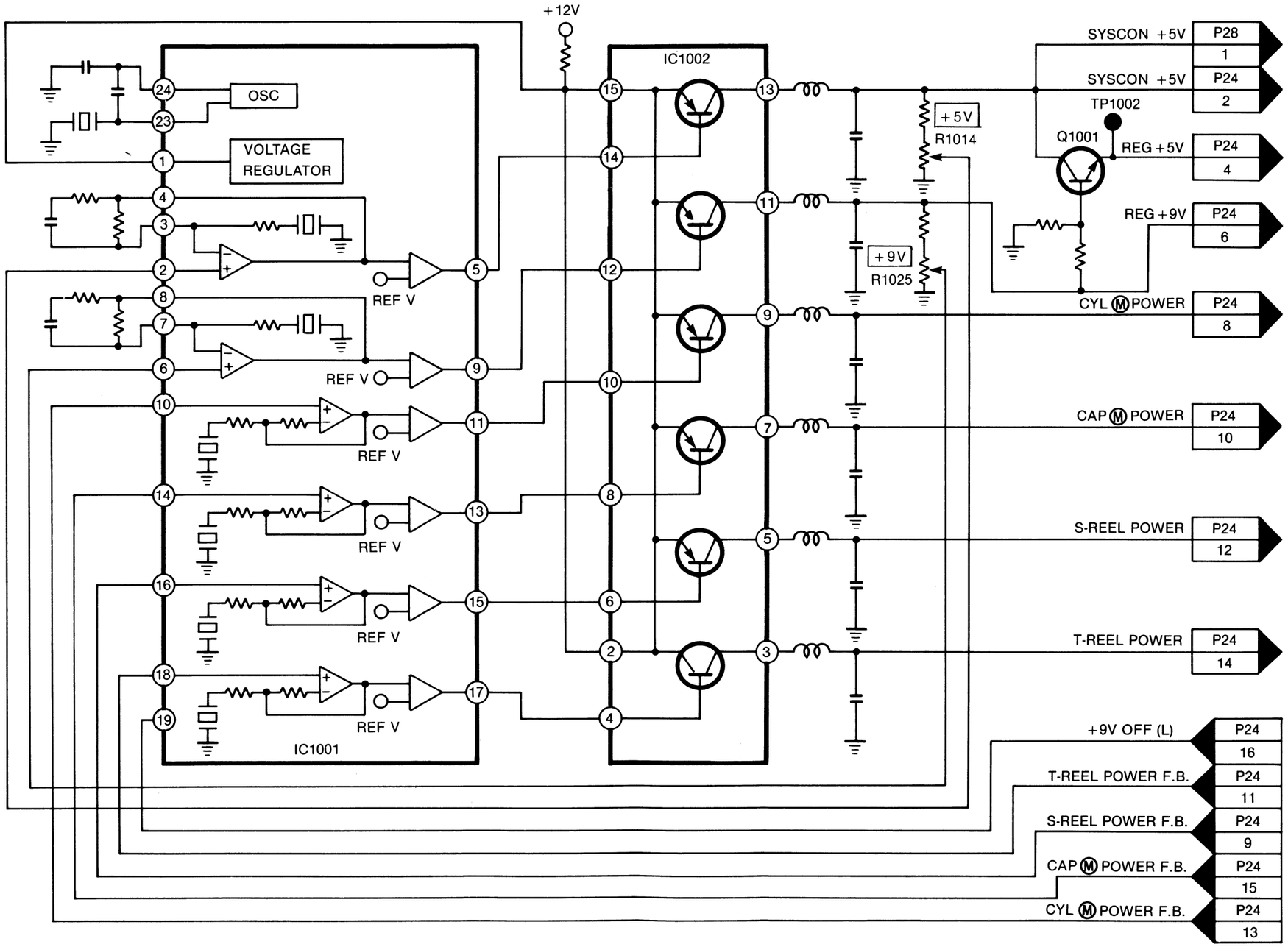
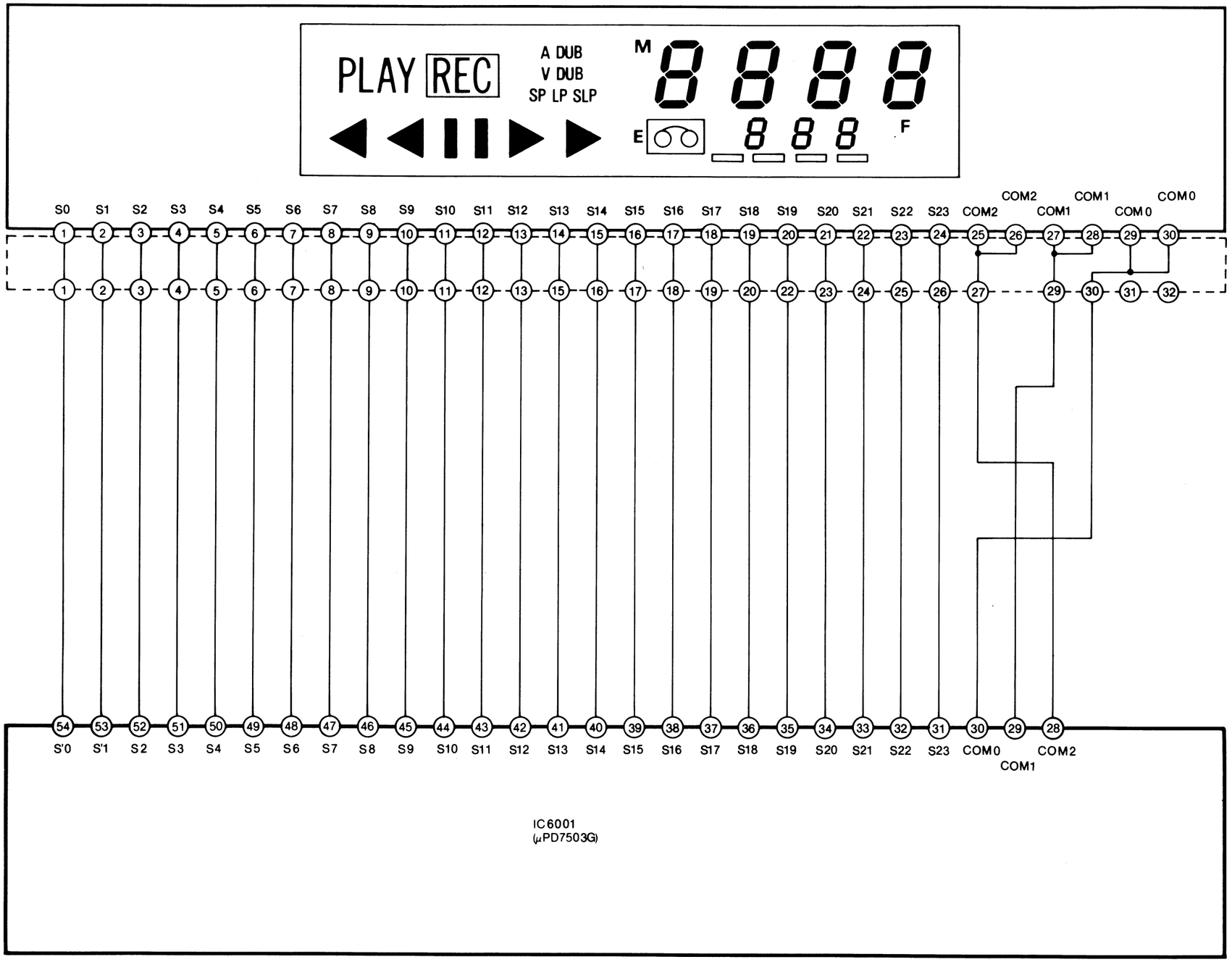
OVERALL BLOCK DIAGRAM



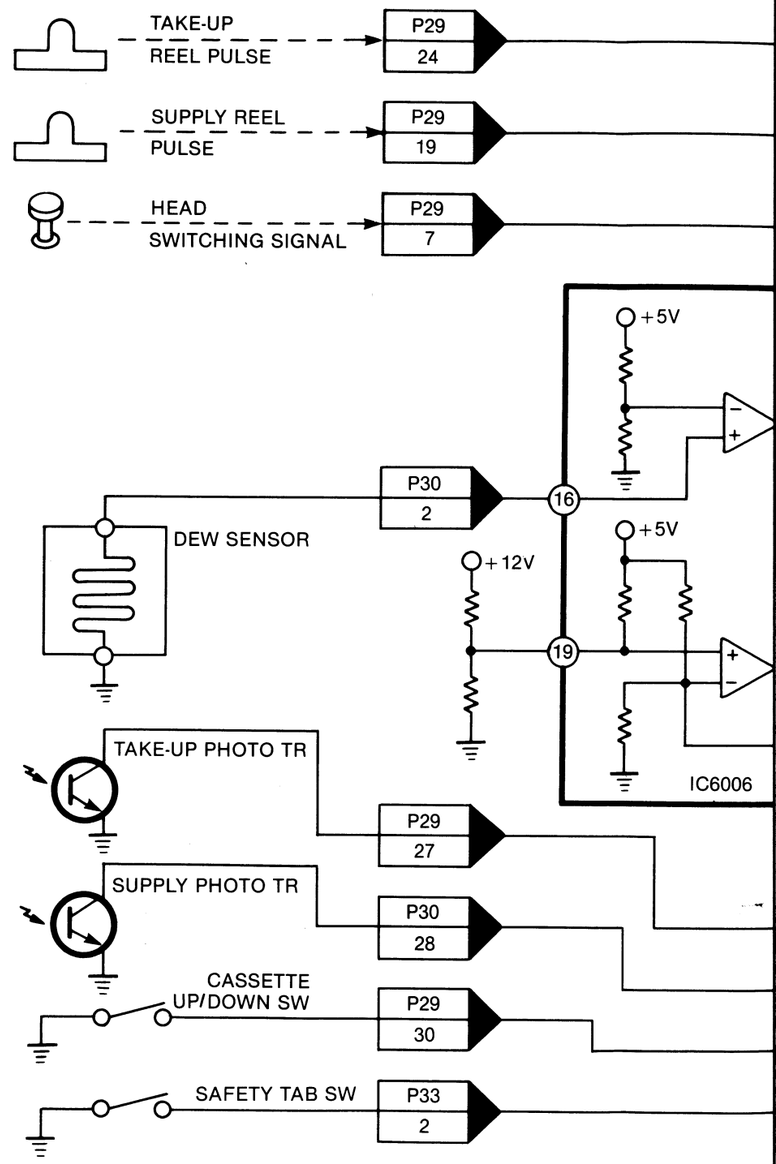
A.V.R. BLOCK DIAGRAM



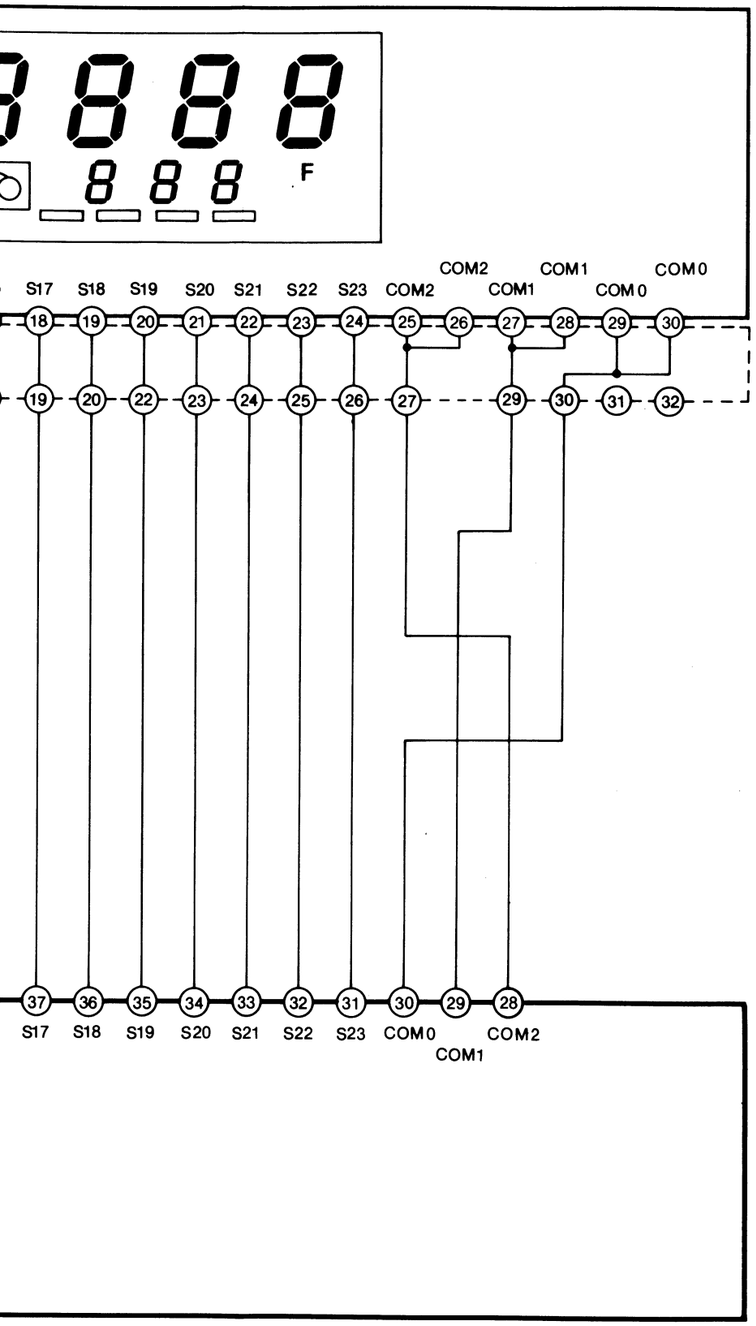
LCD DRIVE BLOCK DIAGRAM (SYSTEM CONTROL)



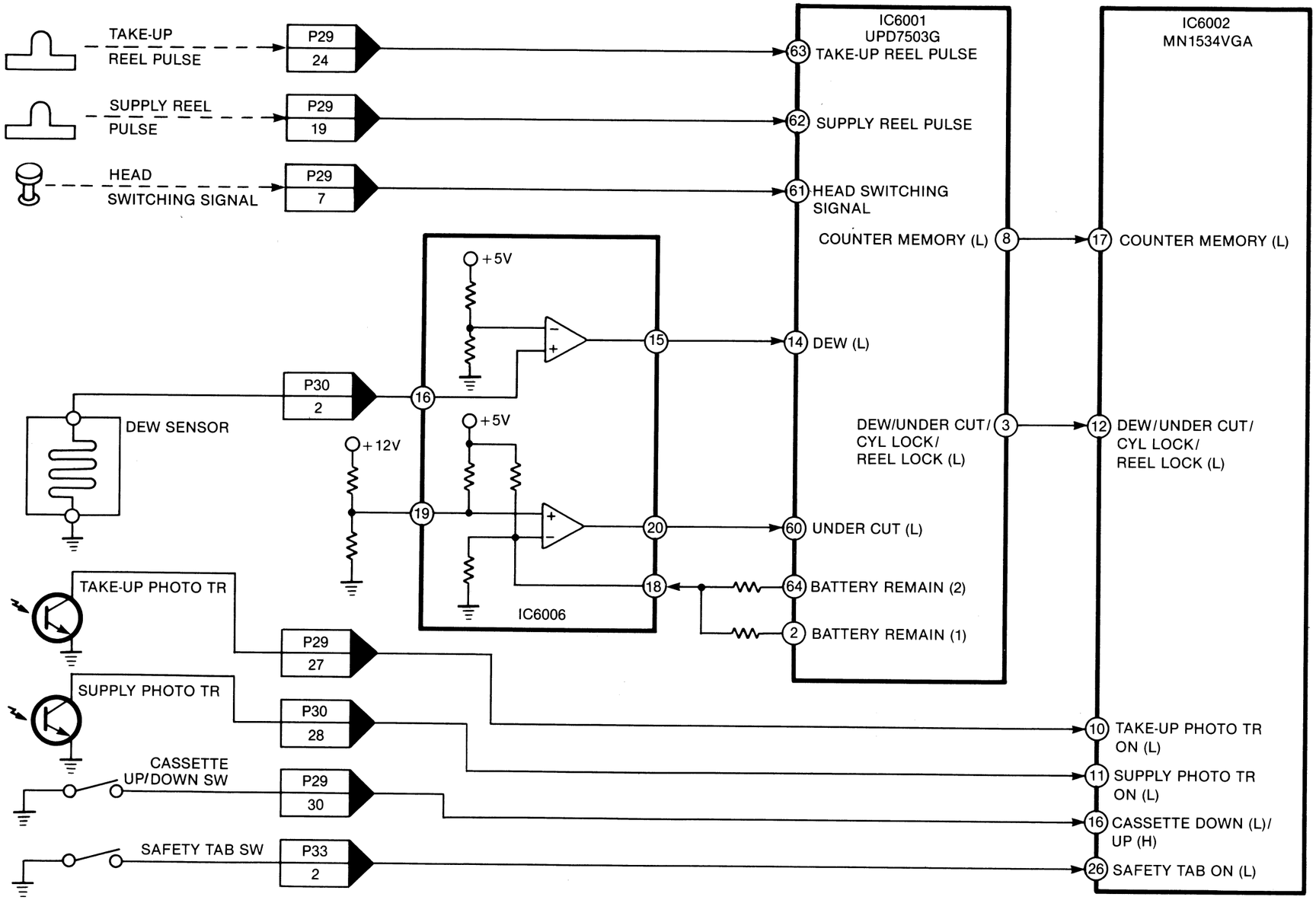
SAFETY DEVICE BLOCK DIAGRAM (SY



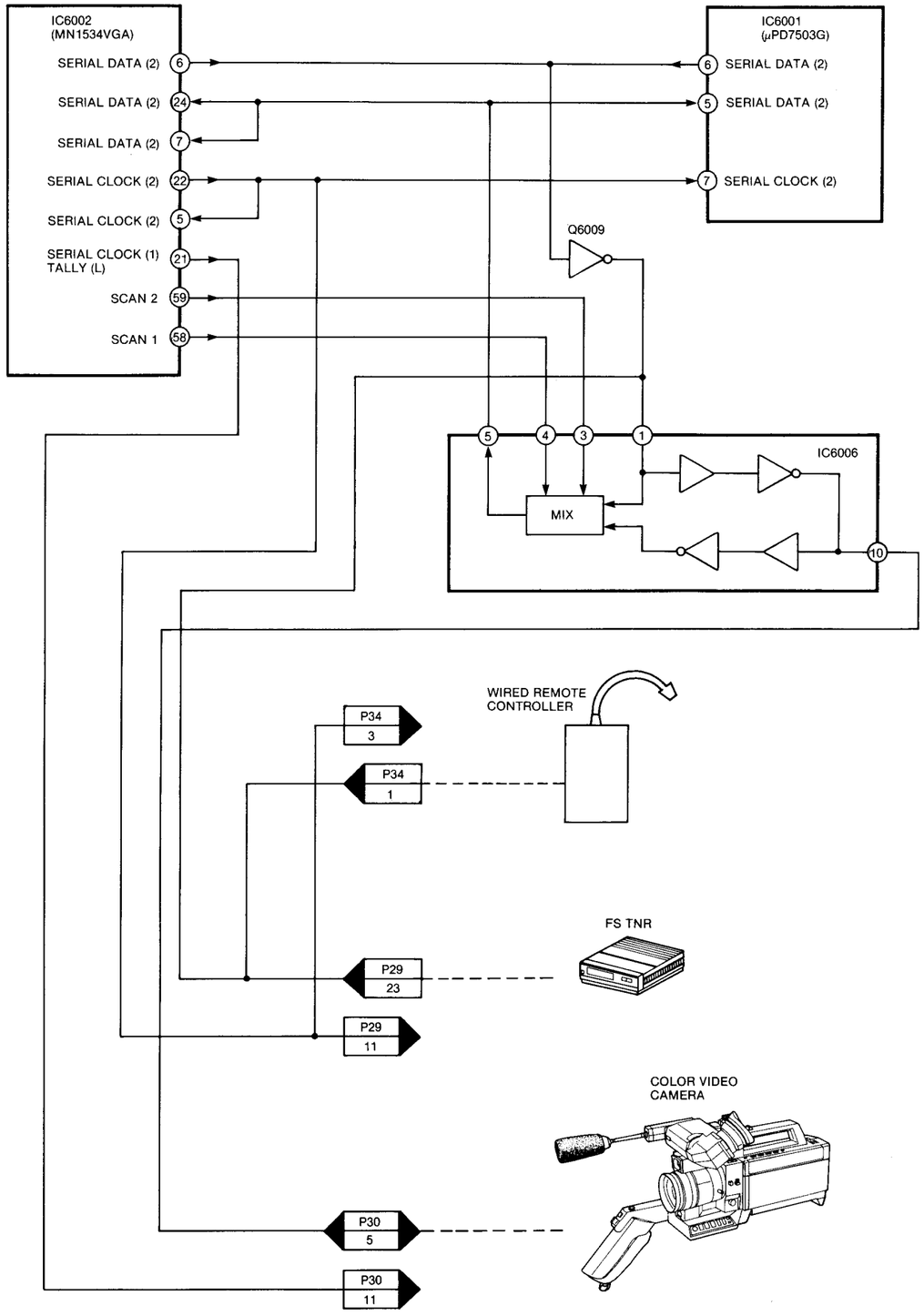
L)



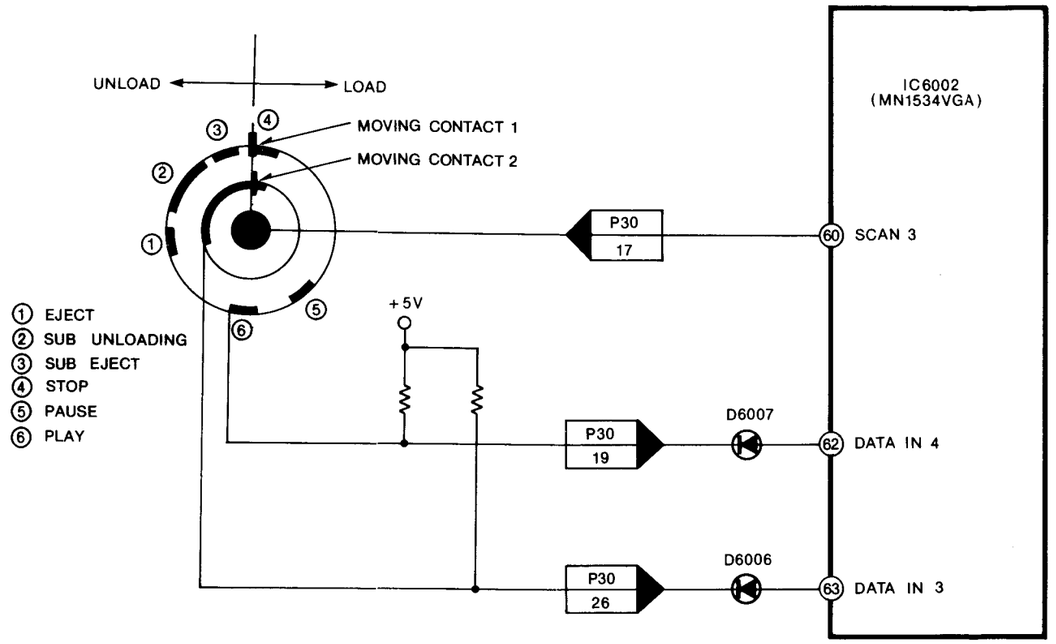
SAFETY DEVICE BLOCK DIAGRAM (SYSTEM CONTROL)

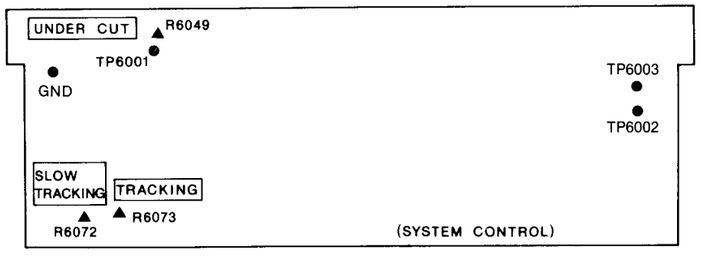


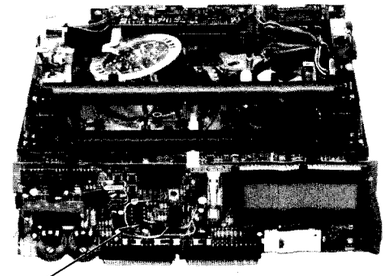
SERIAL DATA TRANSMISSION (SYSTEM CONTROL)



MODE SELECT SWITCH BLOCK DIAGRAM (SYSTEM CONTROL)



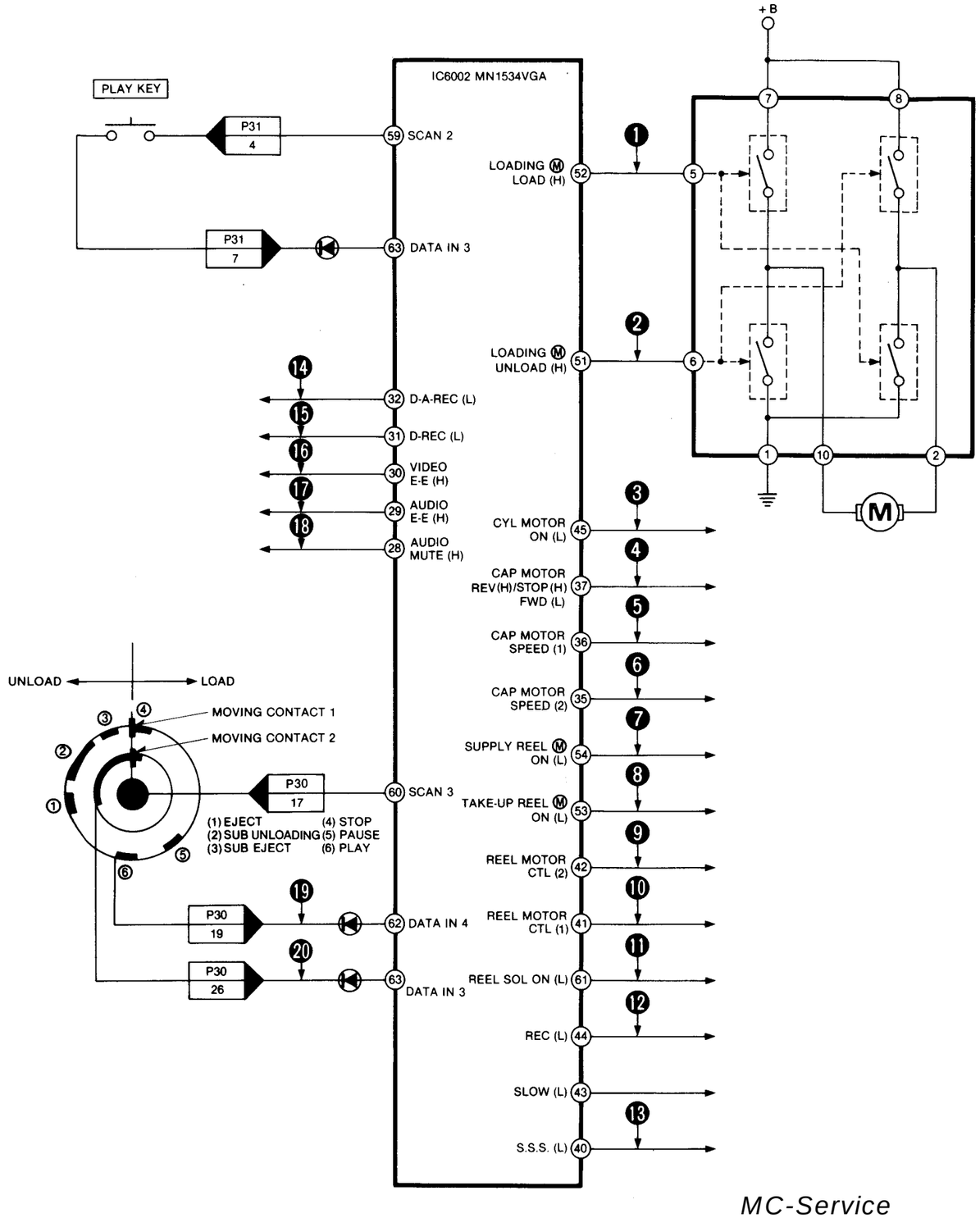




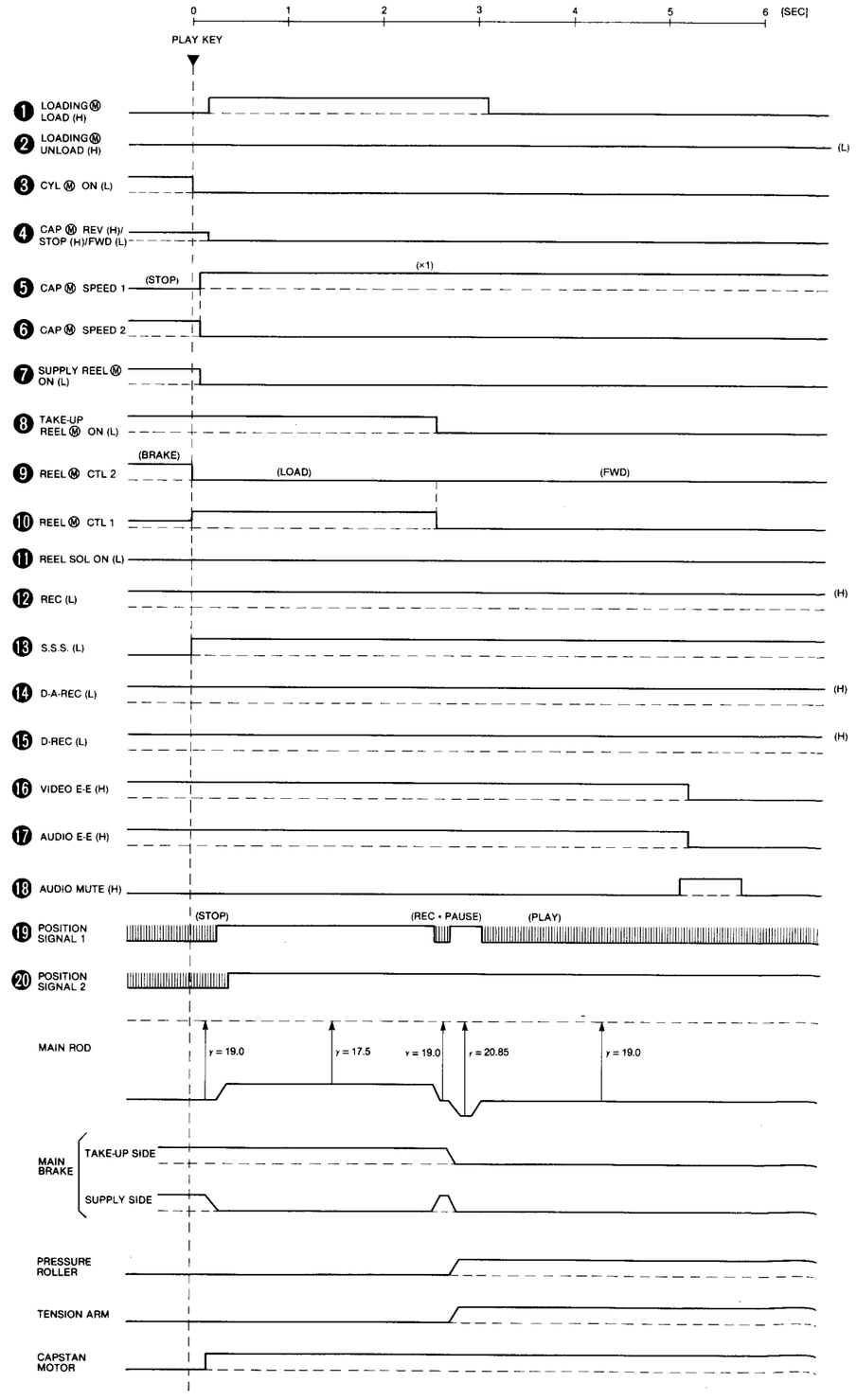
System Control C.B.A

MC-Service

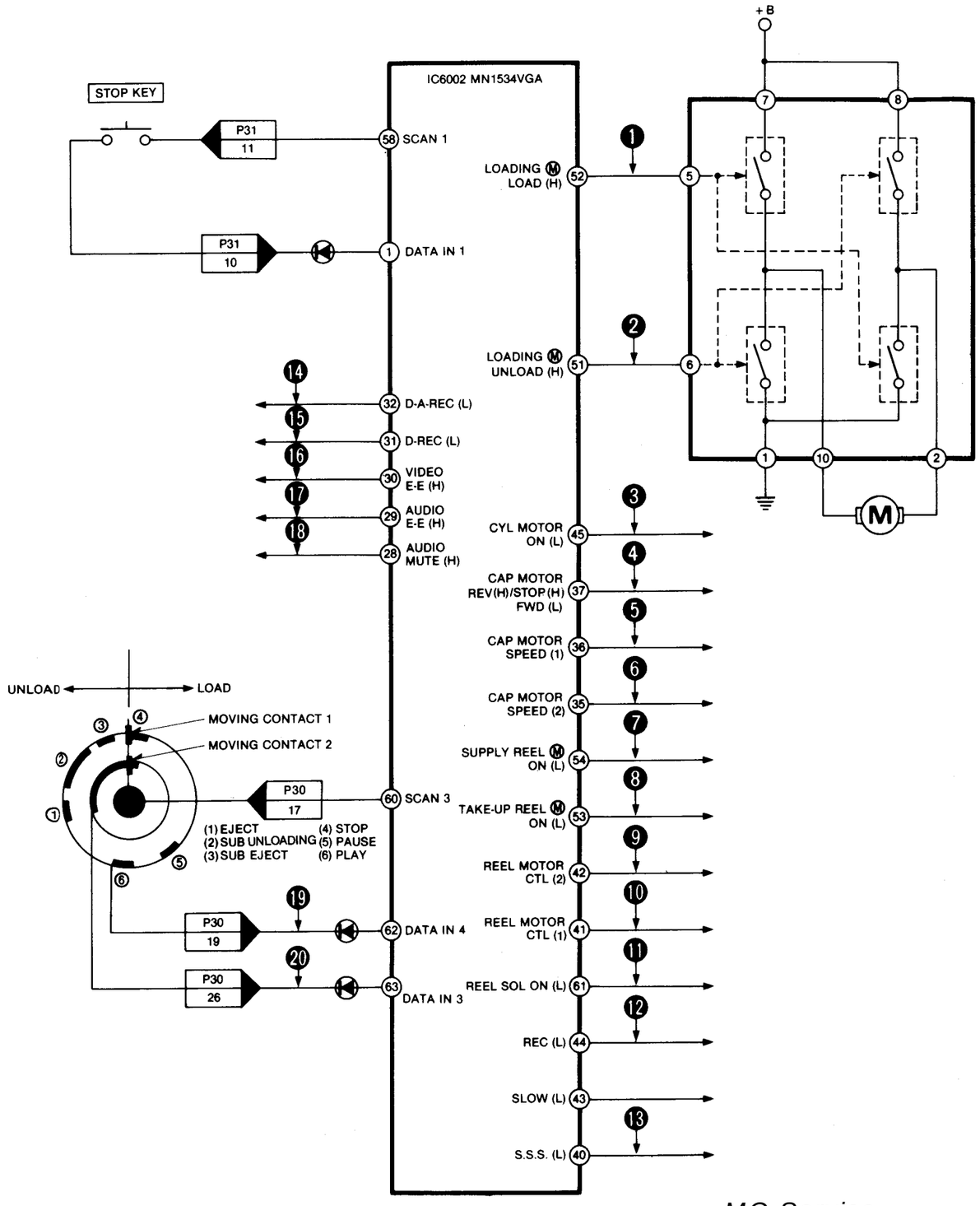
STOP → PLAY BLOCK DIAGRAM (SYSTEM CONTROL)



STOP → PLAY MODE TIMING CHART

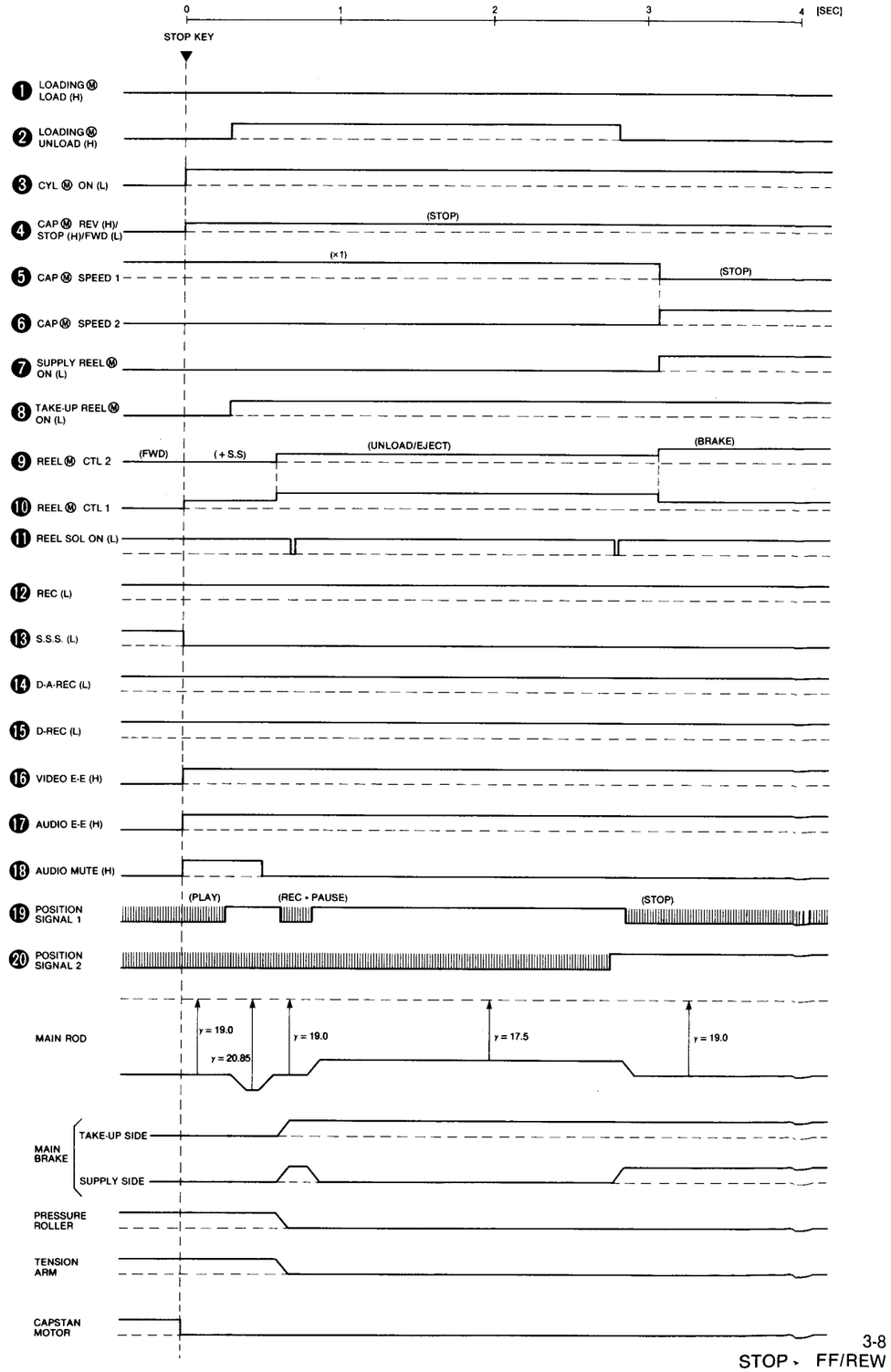


PLAY → STOP BLOCK DIAGRAM (SYSTEM CONTROL)

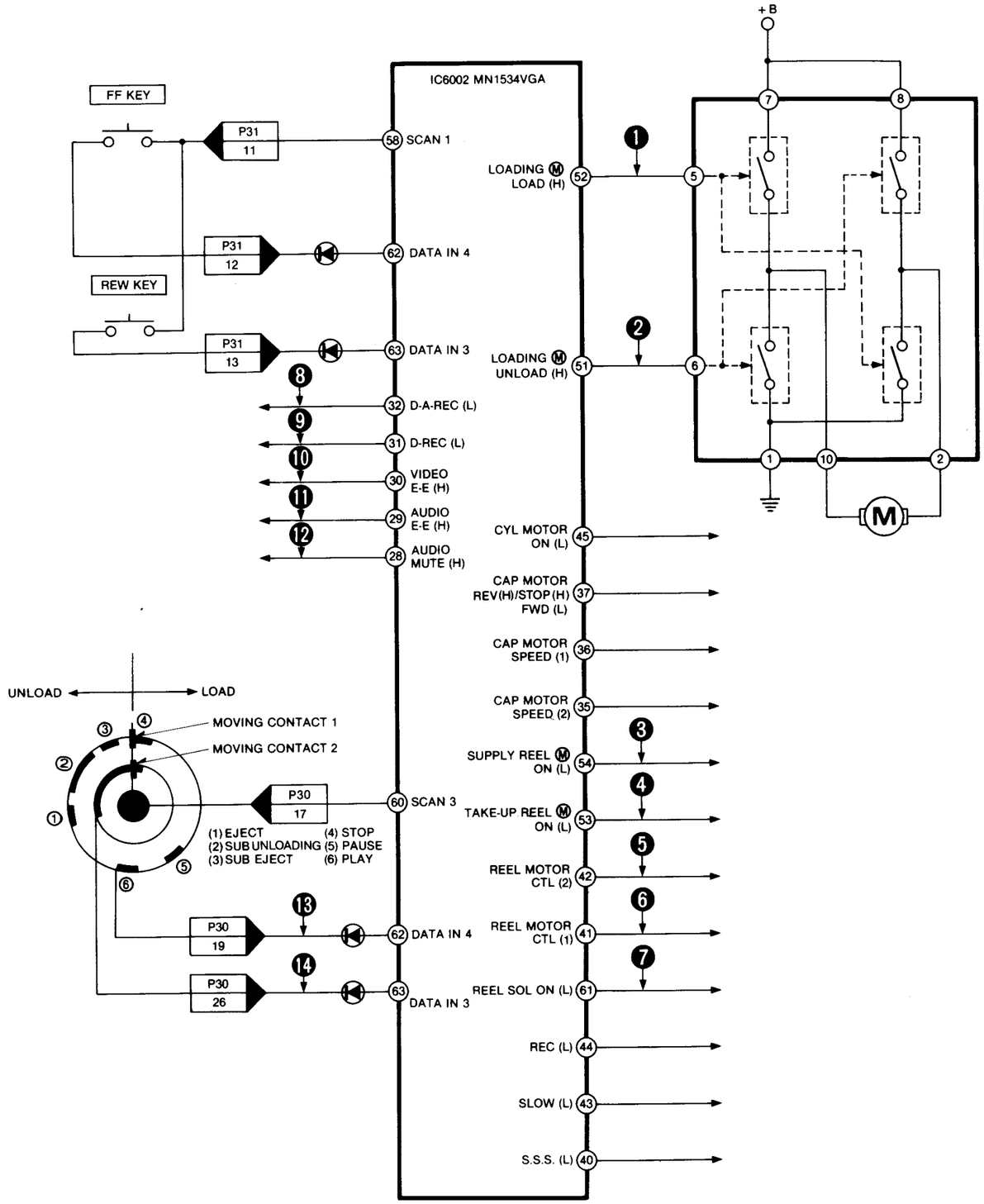


MC-Service

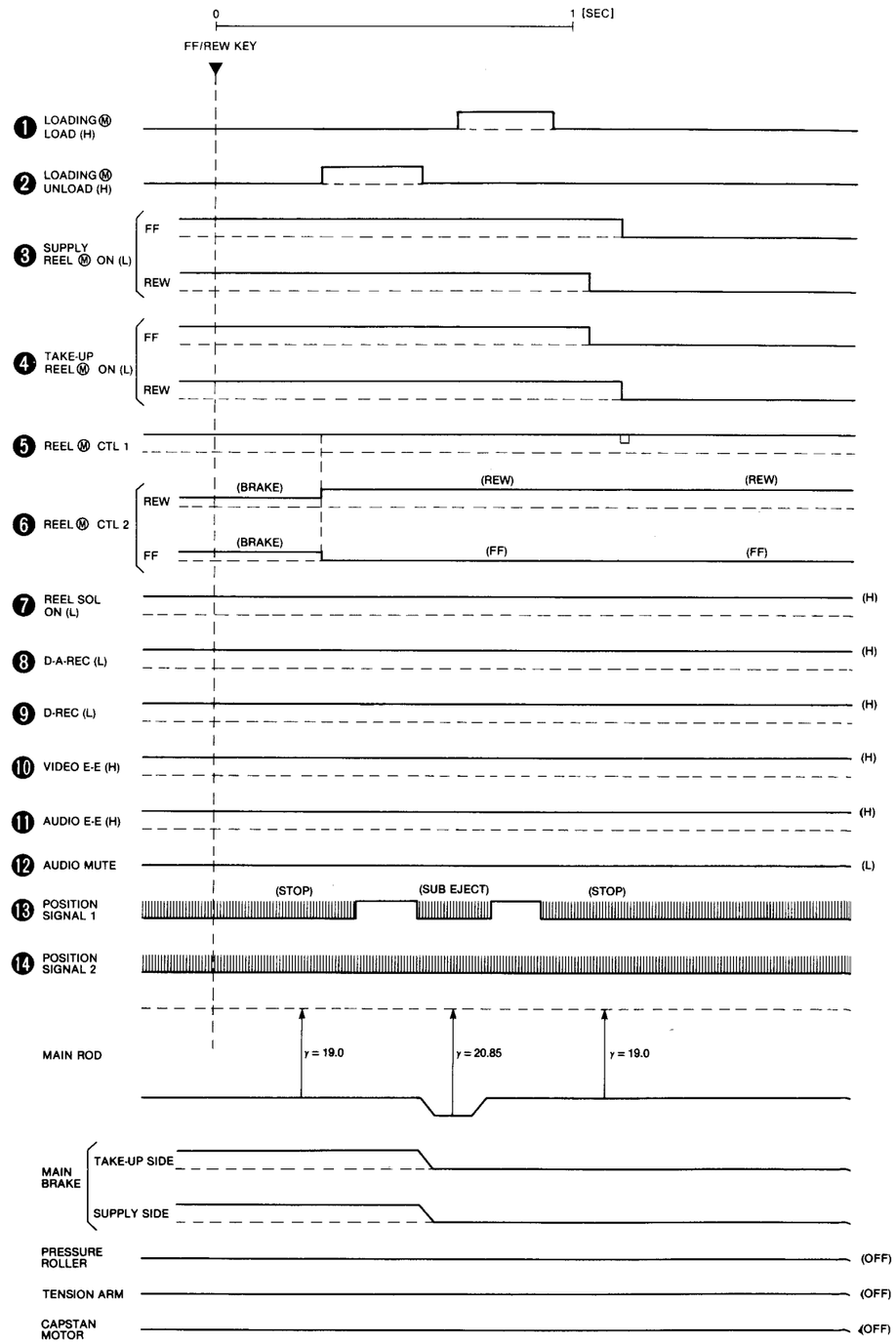
PLAY → STOP MODE TIMING CHART



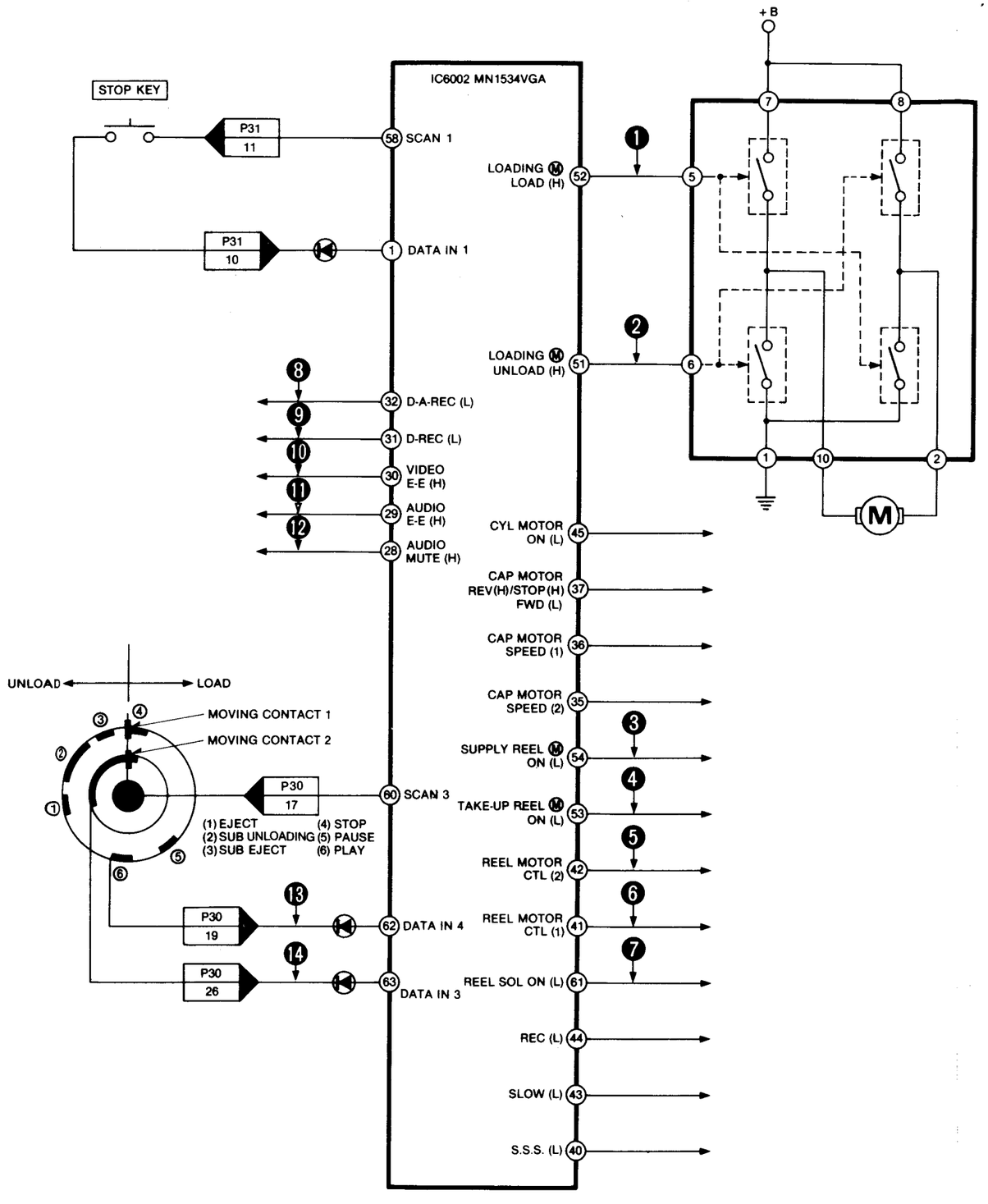
STOP → FF/REW BLOCK DIAGRAM (SYSTEM CONTROL)



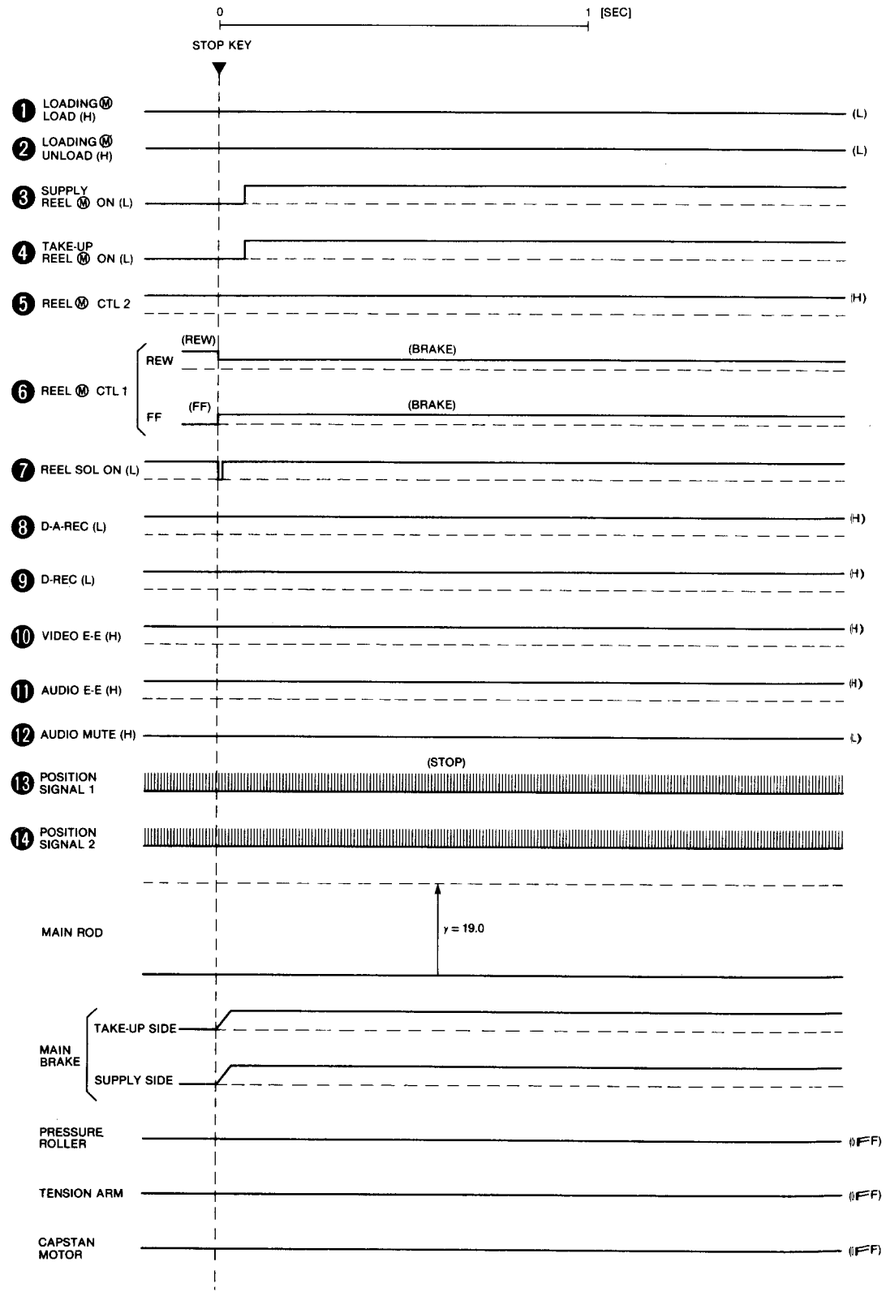
STOP → FF REW MODE TIMING CHART



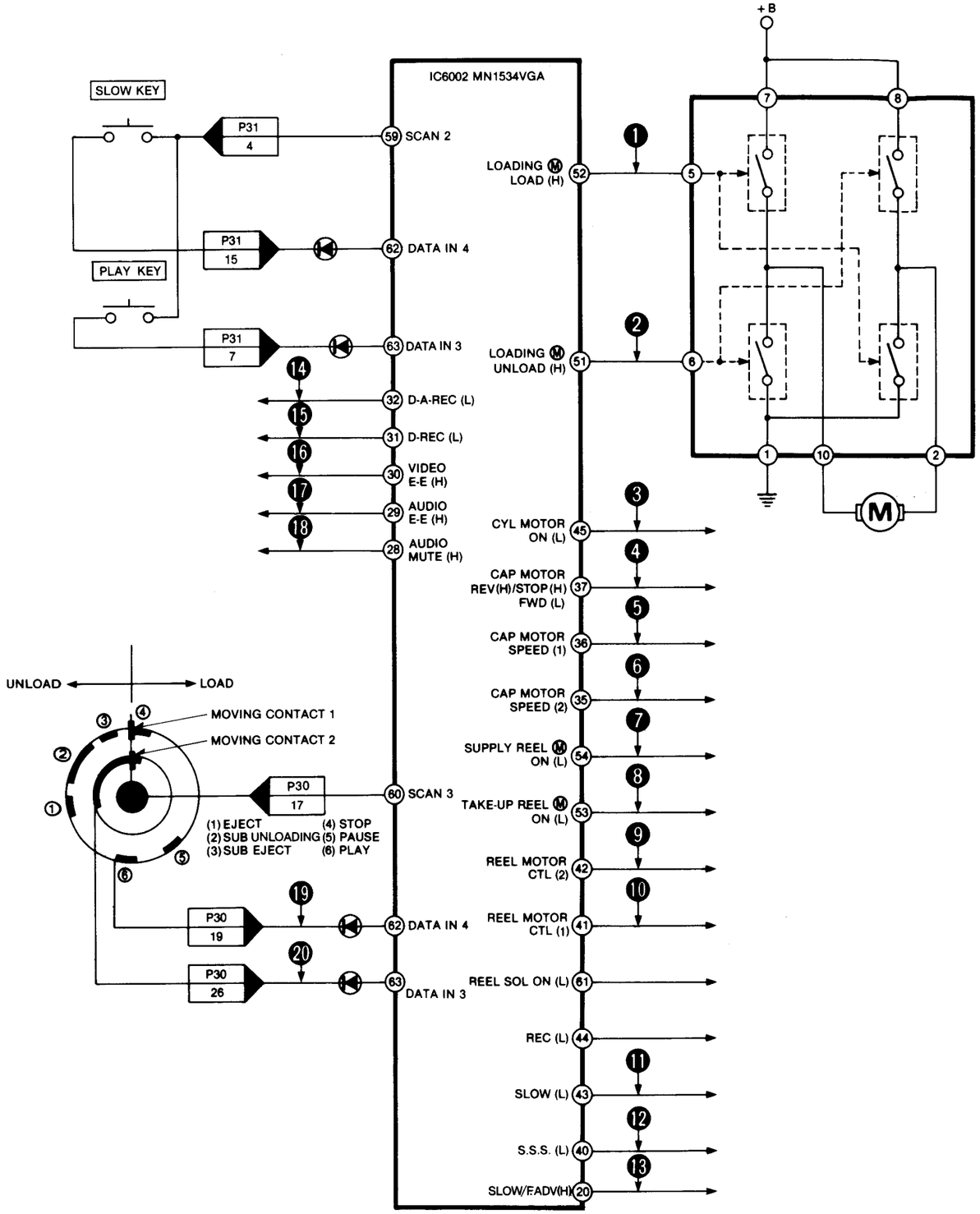
FF/REW → STOP BLOCK DIAGRAM (SYSTEM CONTROL)



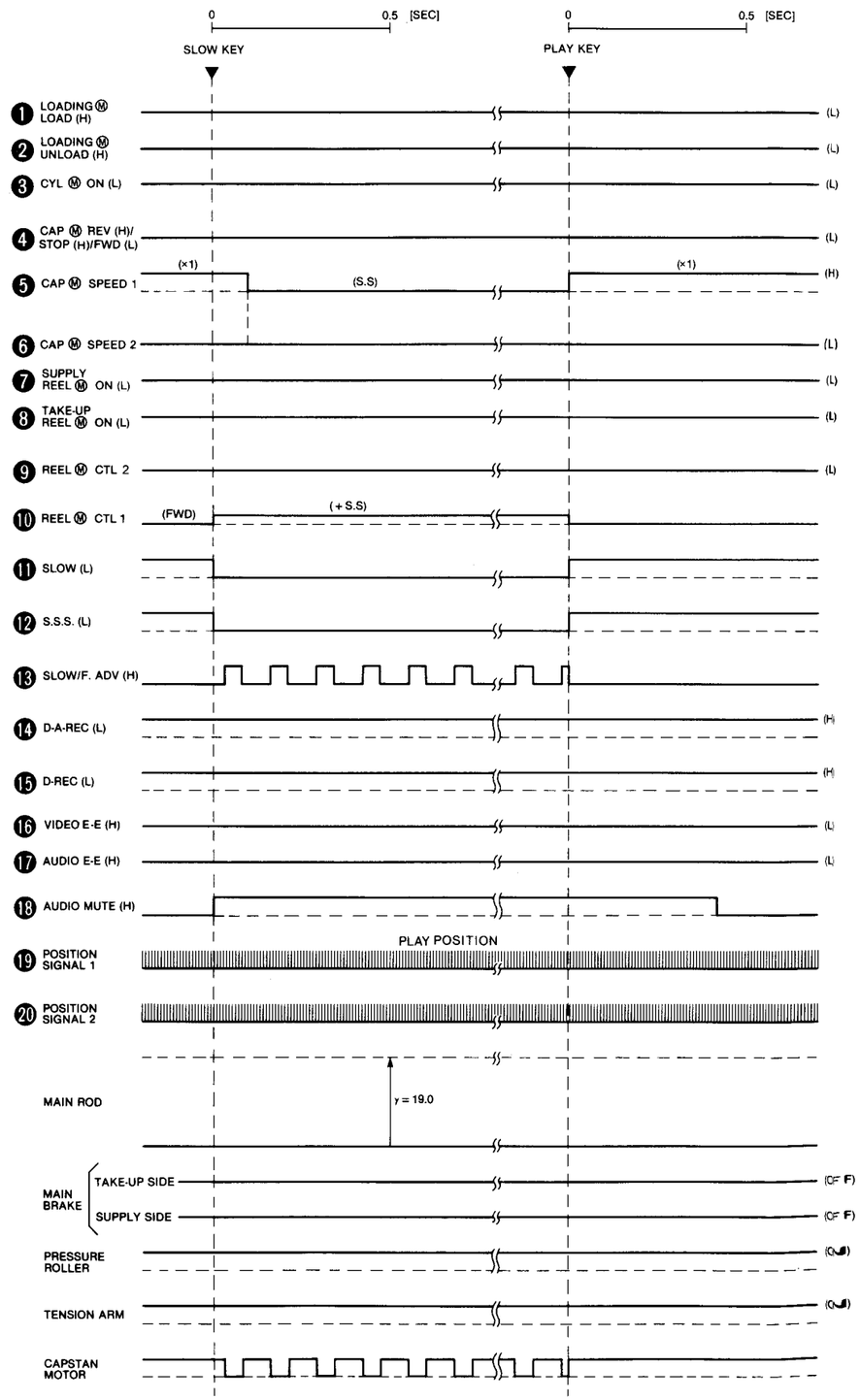
FF/REW → STOP MODE TIMING CHART



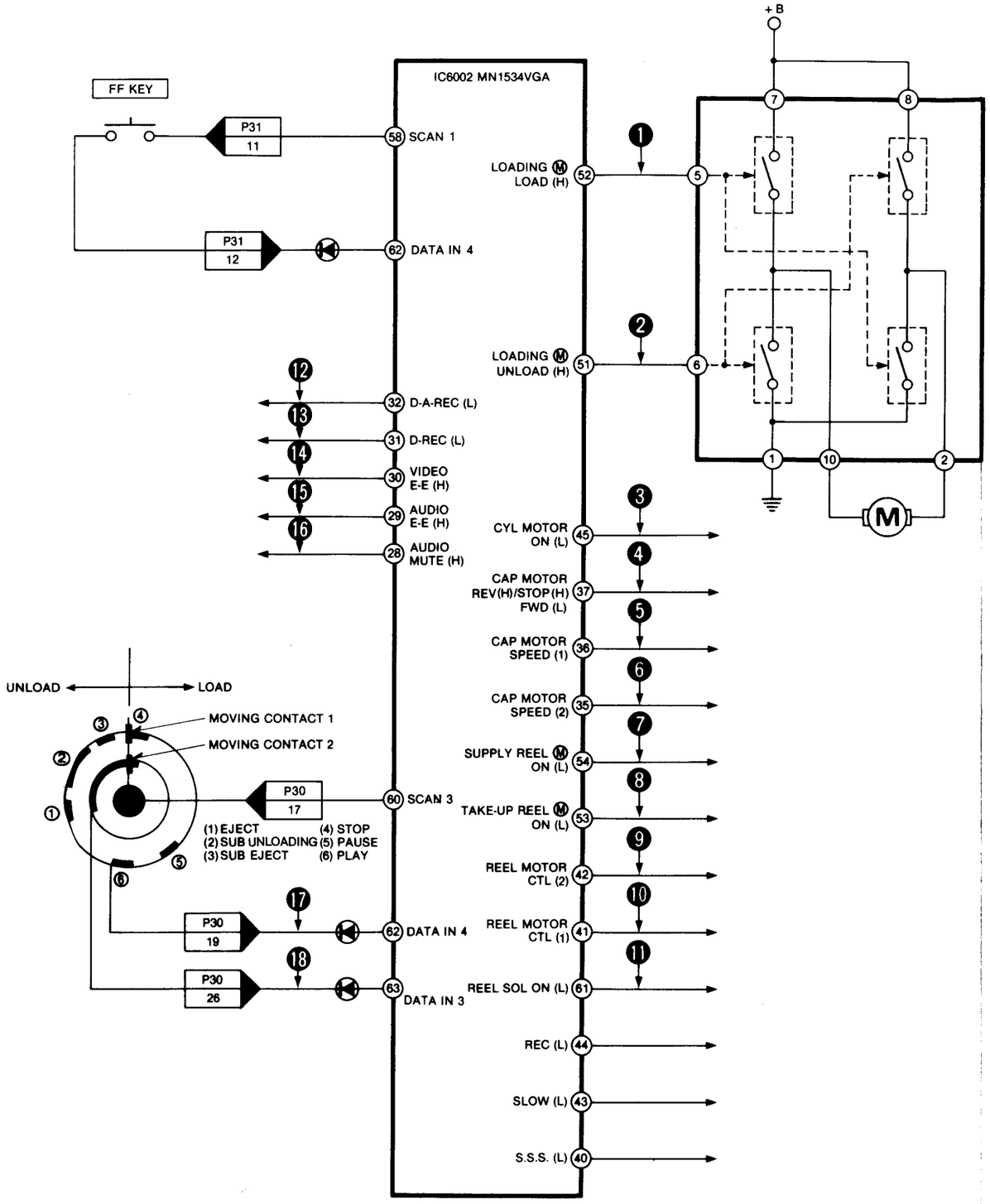
PLAY → SLOW → PLAY BLOCK DIAGRAM (SYSTEM CONTROL)



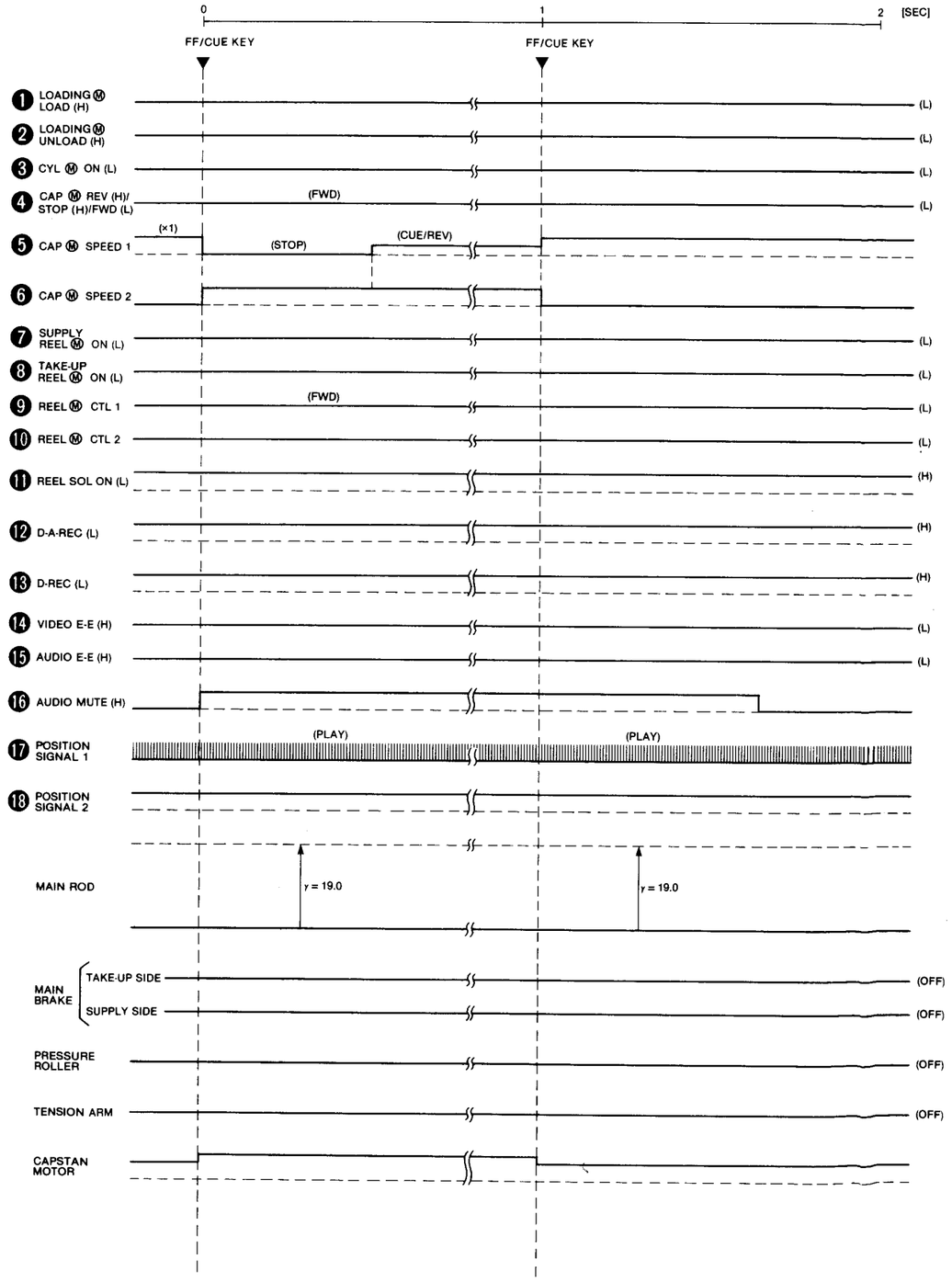
PLAY → SLOW → PLAY MODE TIMING CHART



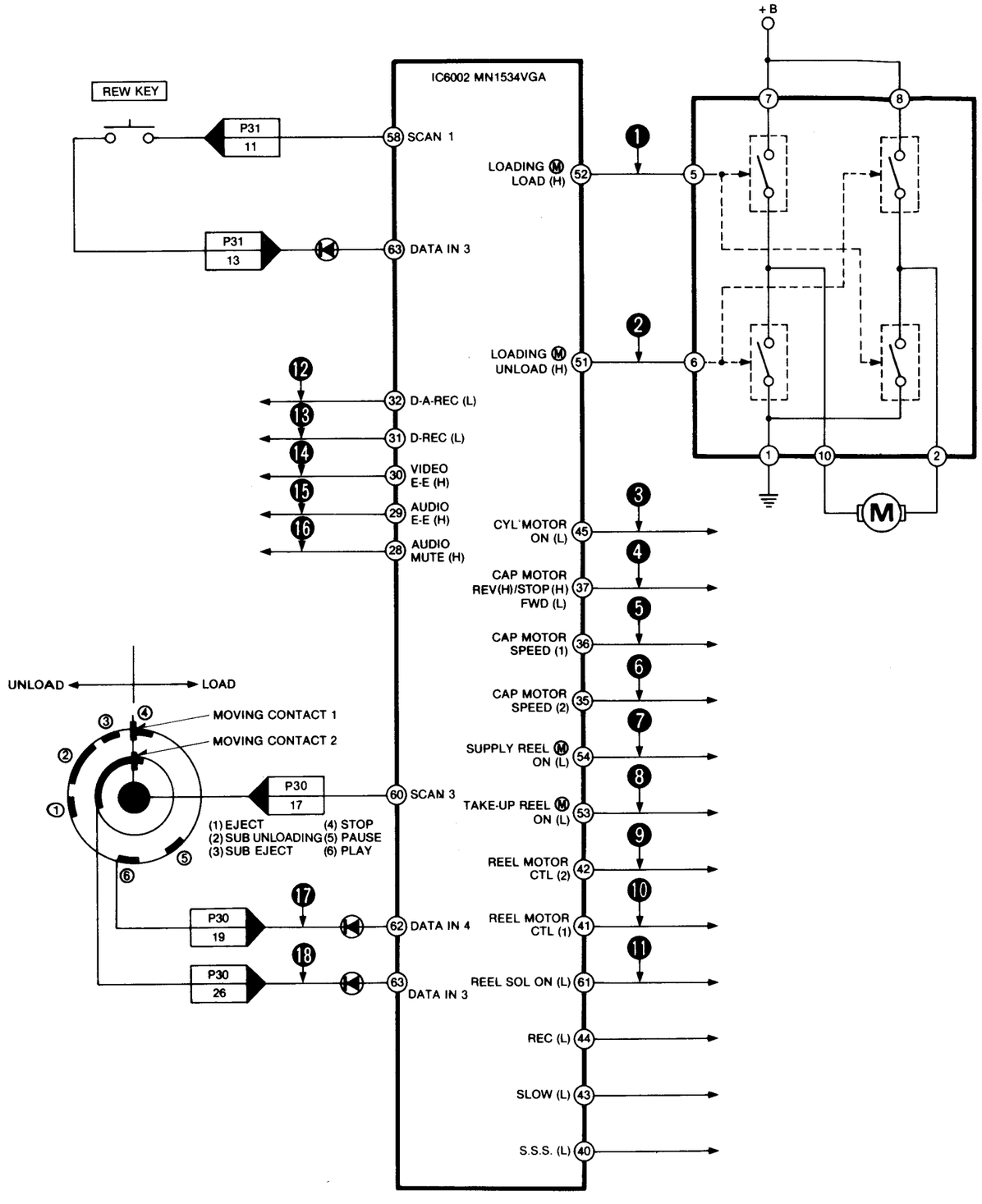
PLAY → CUE → PLAY BLOCK DIAGRAM (SYSTEM CONTROL)



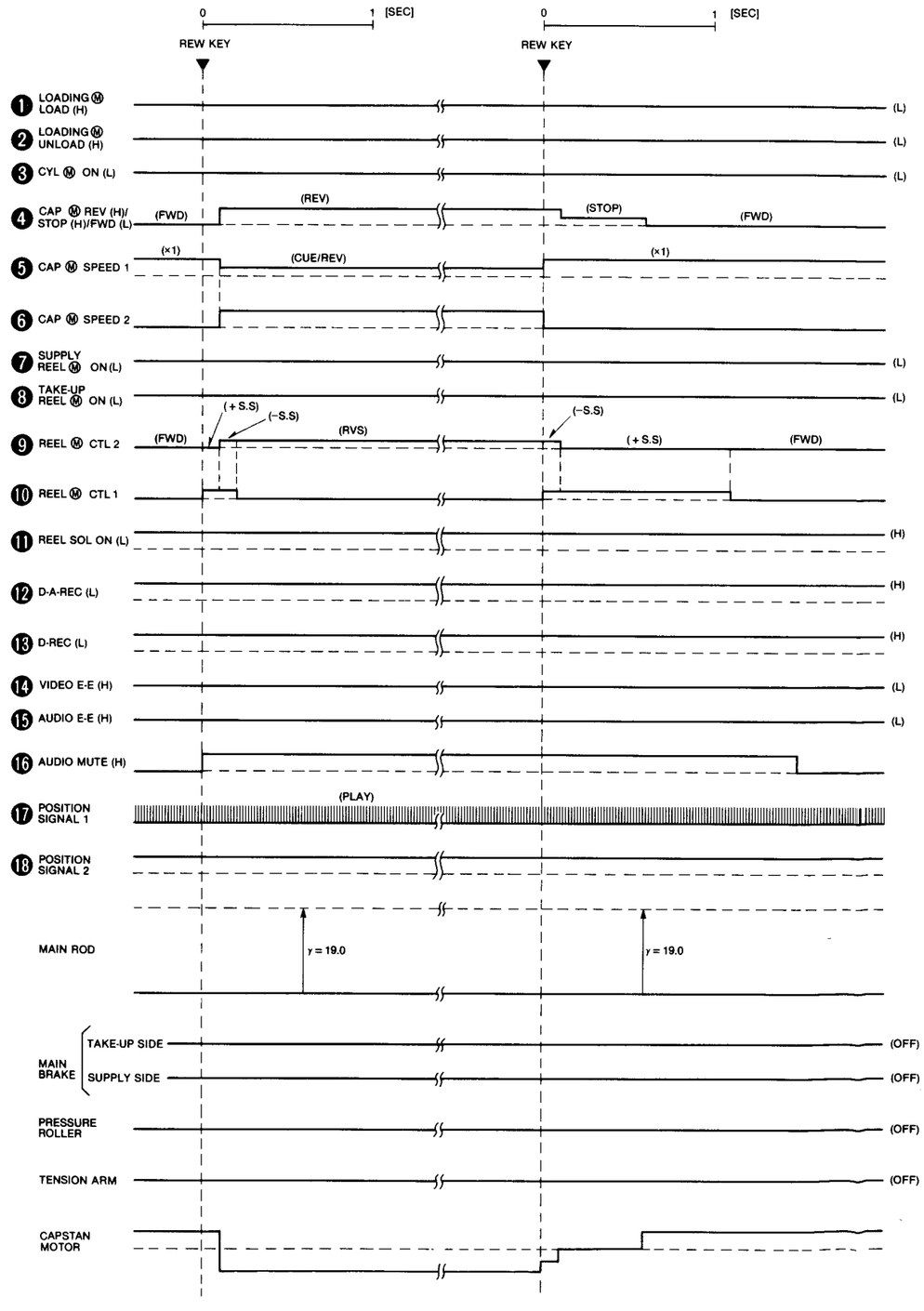
PLAY → CUE → PLAY MODE TIMING CHART



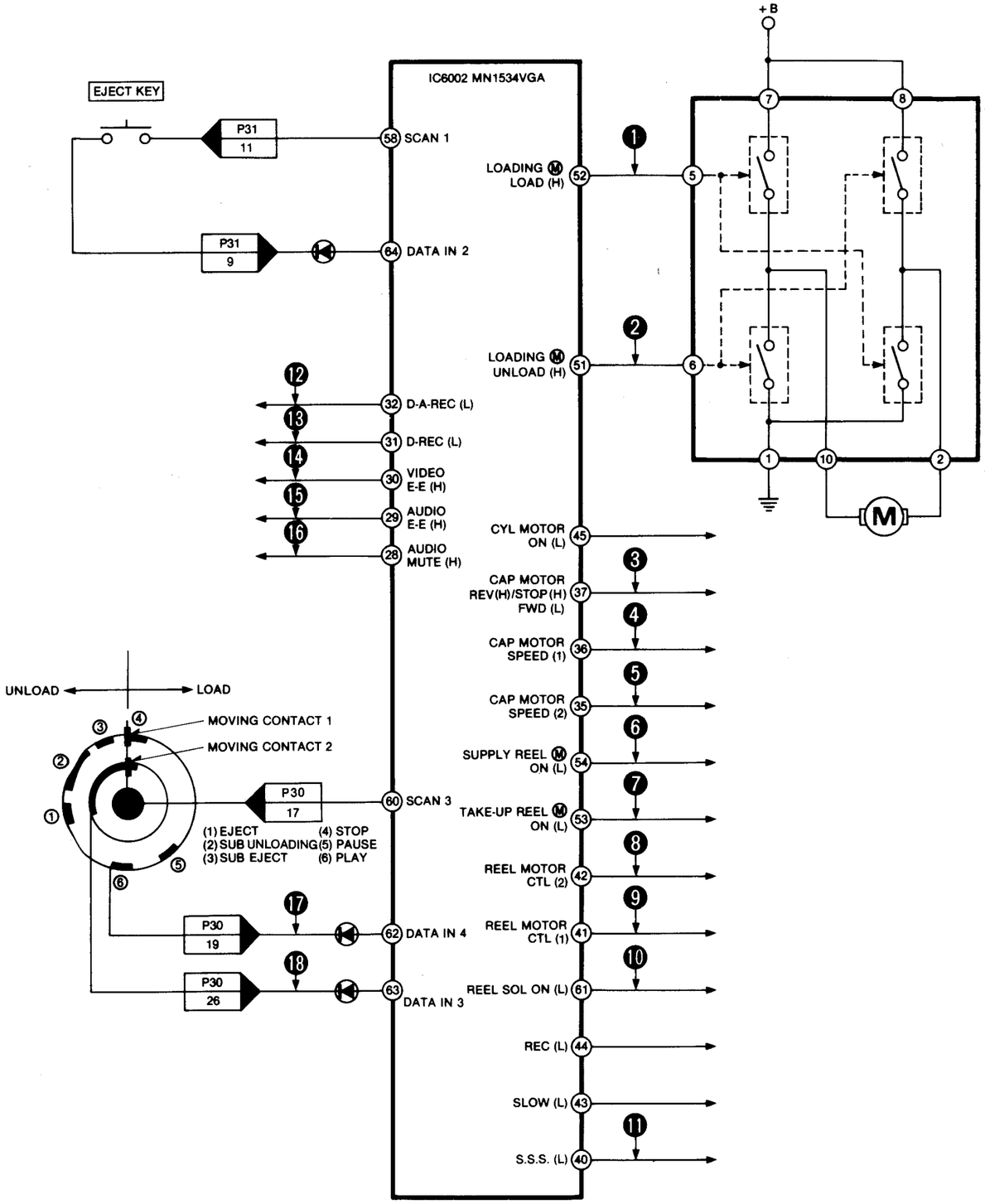
PLAY → REVIEW → PLAY BLOCK DIAGRAM (SYSTEM CONTROL)



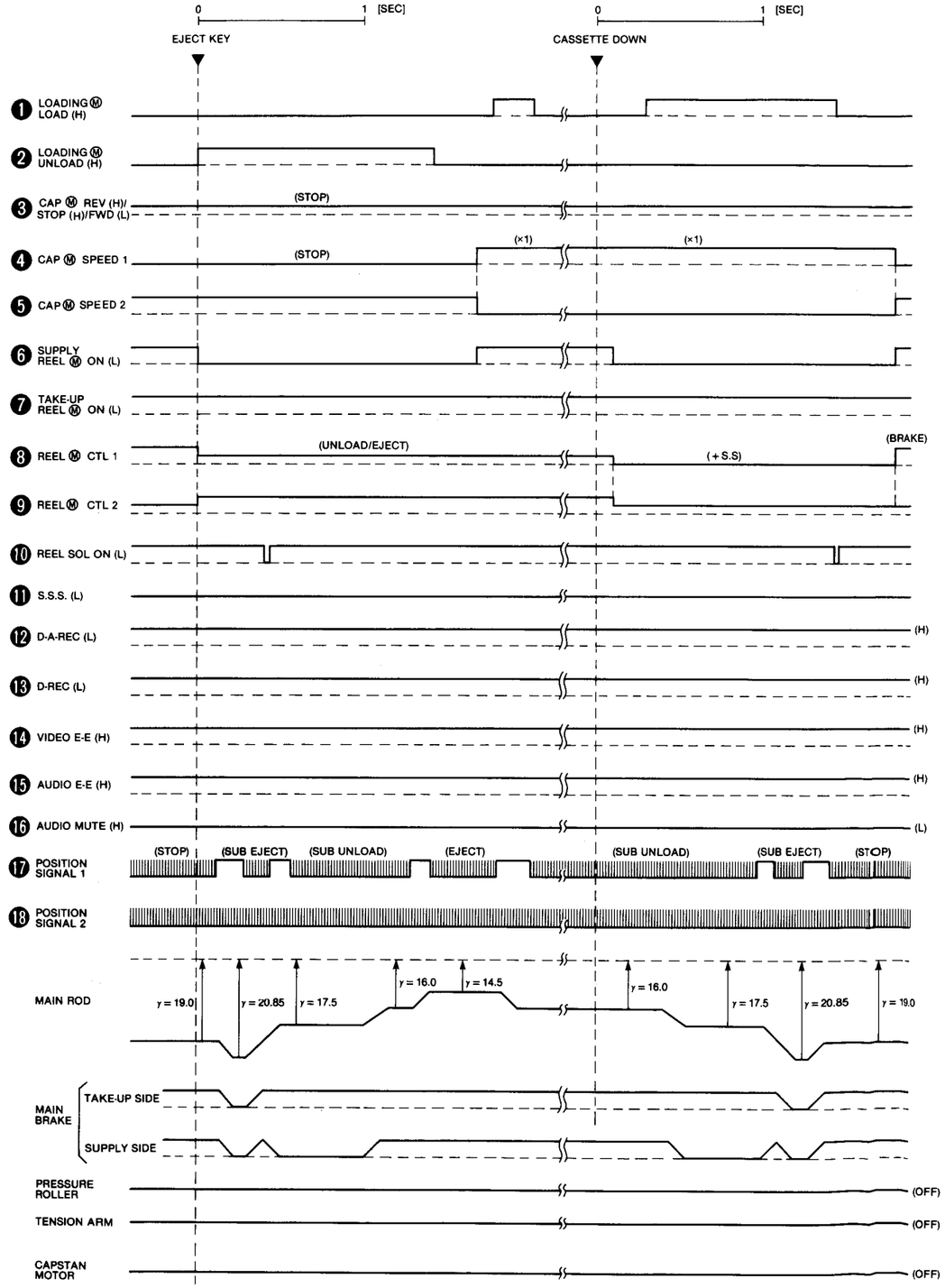
PLAY → REVIEW → PLAY MODE TIMING CHART



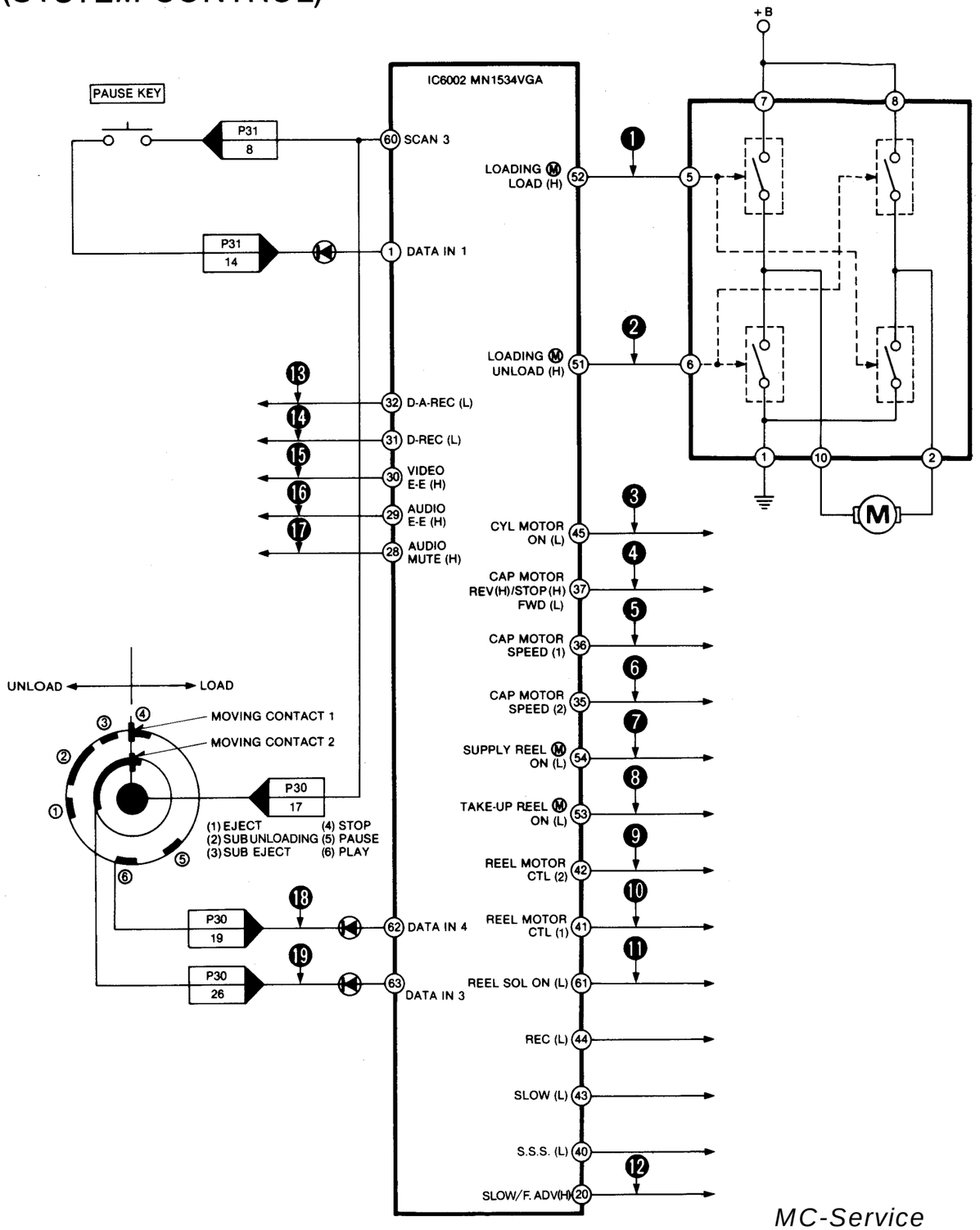
STOP → EJECT BLOCK DIAGRAM (SYSTEM CONTROL)



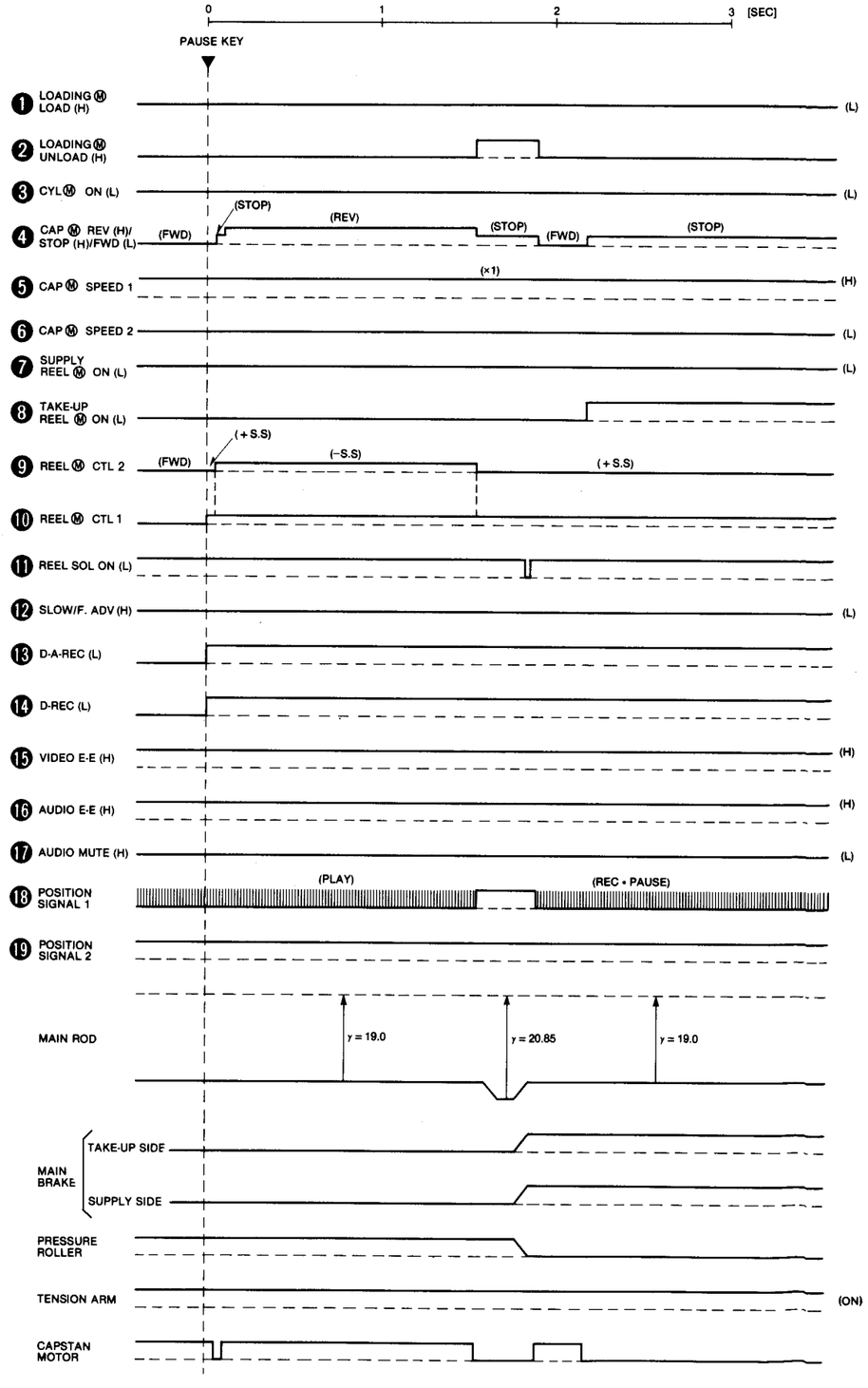
STOP → EJECT MODE TIMING CHART



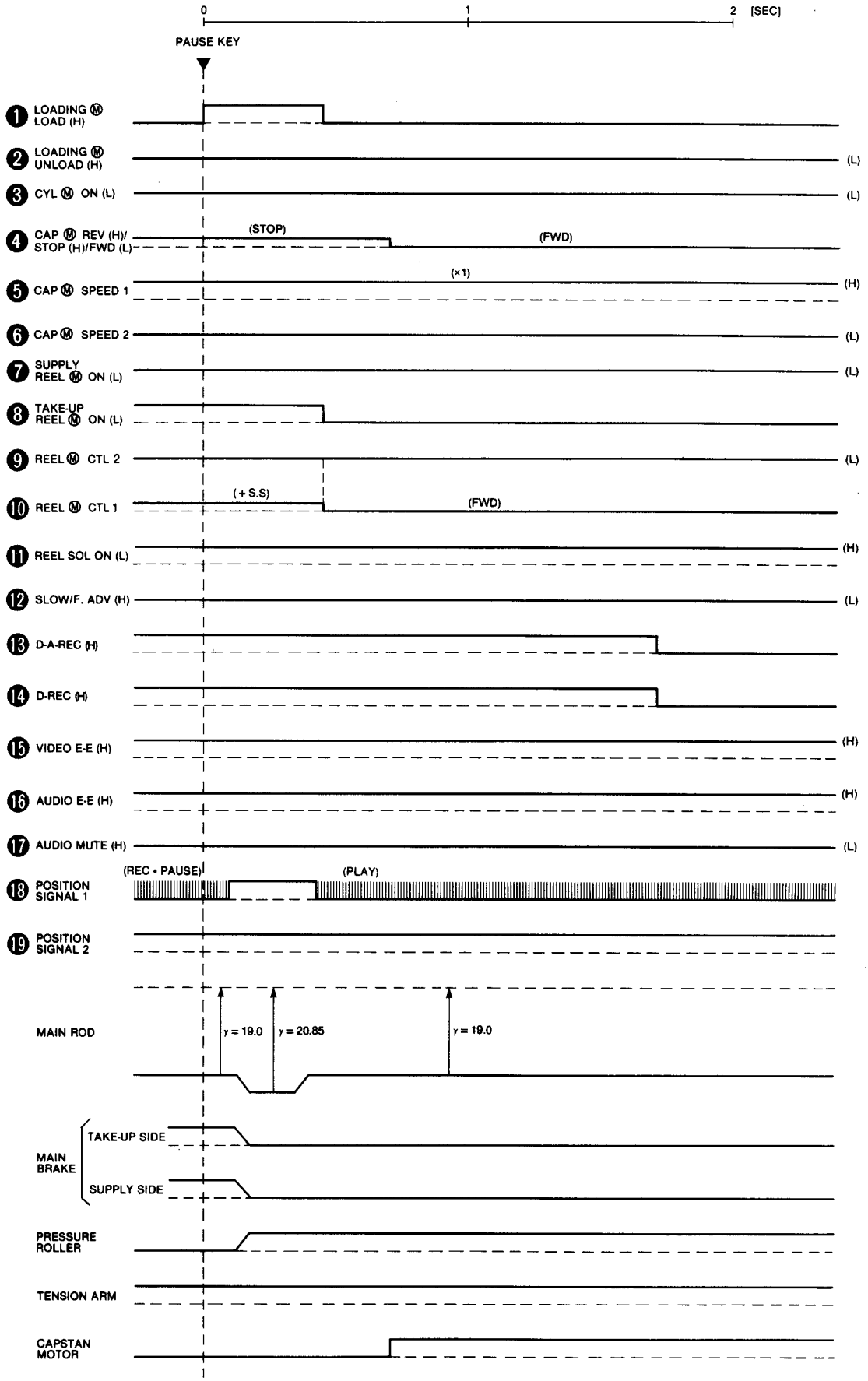
REC • PLAY → REC • PAUSE → REC • PLAY BLOCK DIAGRAM
(SYSTEM CONTROL)



REC • PLAY → REC • PAUSE MODE TIMING CHART



REC • PAUSE → REC • PLAY MODE TIMING CHART



MICROCOMPUTER (IC6002: MN1534VGA) I/O CHART

PIN	I/O	NAME/OPERATION		
1	I	DATA IN 1	SCAN PULSE	OPERATION
			SCAN 1	STOP KEY
			SCAN 2	REC KEY
			SCAN 3	PAUSE/STILL KEY
2	—	NOT USED		
3	I	SIRQ		
4	I	IBQ		
5	I	SERIAL CLOCK (2)		
6	O	SERIAL DATA (2)		
7	I	SERIAL DATA (2)		
8	I	RESET		
9	I	V REF (1)		
10	I	TAKE UP PHOTO TR (L)		
11	I	SUPPLY PHOTO TR (L)		
12	I	DEW/UNDER CUT/CYL LOCK/REEL LOCK (L)		
13	I	STAND-BY (L)		
14	I	V REF (2)		
15	I	SLP (H)/LP (M)/SP (L)		
16	I	CASSETTE UP (H)/DOWN (L)		
17	I	COUNTER MEMORY (L)		
18	I	CAMERA PAUSE (H)		
19	—	NOT USED		
20	O	SLOW/F. ADV (H)		
21	O	SERIAL CLOCK (1)/TALLY (L)		
22	O	SERIAL CLOCK (2)		
23	I	CAMERA IN (L)		
24	I	SERIAL DATA (2)		
25	I	POWER SW ON (L)		
26	I	SAFETY TAB SW ON (L)		
27	O	CURRENT EMPHASIS (L)		
28	O	AUDIO MUTE (H)		
29	O	AUDIO E-E (H)		
30	O	VIDEO E-E (H)		
31	O	REC (L)		
32	O	AUDIO REC (L)		
33	O	FULL ERASE (L)		
34	O	SENSOR LED DRIVE PULSE		
35	O	CAP MOTOR SPEED DATA (2)		
36	O	CAP MOTOR SPEED DATA (1)		

MICROCOMPUTER (IC6001: μPD7503G) I/O CHART

PIN	I/O	NAME/OPERATION
37	O	CAP MOTOR REV (H)/STOP (M)/FWD (L)
38	O	TAPE SPEED REC (H)/P.B (M)/MEMORY (L)
39	O	CAP MOTOR INSERT (H)/NOR (M)/REC START (L)
40	O	CAP MOTOR SLOW/STILL/STOP (L)
41	O	REEL MOTOR CTL DATA (1)
42	O	REEL MOTOR CTL DATA (2)
43	O	SLOW (L)
44	O	VIDEO REC (L)
45	O	CYL MOTOR ON (L)
46	O	REEL FWD (H)/REV (L)
47	O	LP/SLP (H)
48	O	SLP (H)
49	O	POWER SW OFF (L)
50	O	CAMERA STAND-BY/TIMER SET (H)
51	O	LOADING MOTOR UNLOAD (H)
52	O	LOADING MOTOR LOAD (H)
53	O	TAKE UP REEL MOTOR ON (L)
54	O	SUPPLY REEL MOTOR ON (L)
55	I	CLOCK (3.58MHz)
56	I	VDD
57	I	VSS (GND)
58	O	SCAN 1
59	O	SCAN 2
60	O	SCAN 3
61	O	REEL SOL ON (L)

PIN	I/O	DATA IN 4	SCAN PULSE	OPERATION
62	I		SCAN 1	FF KEY
			SCAN 2	SLOW KEY
			SCAN 3	POSITION SIGNAL

PIN	I/O	DATA IN 3	SCAN PULSE	OPERATION
63	I		SCAN 1	REW KEY
			SCAN 2	PLAY KEY
			SCAN 3	POSITION SIGNAL

PIN	I/O	DATA IN 2	SCAN PULSE	OPERATION
64	I		SCAN 1	EJECT KEY
			SCAN 2	A. DUB KEY

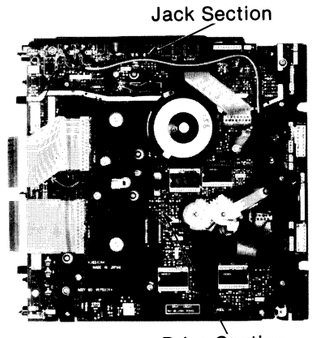
PIN	I/O	NAME/OPERATION
1	—	NOT USED
2	O	BATTERY REMAIN (1)
3	O	DEW/UNDER CUT/CYL LOCK/REEL LOCK (L)
4	—	NOT USED
5	I	SERIAL DATA (2)
6	O	SERIAL DATA (2)
7	I	SERIAL CLOCK (2)
8	O	COUNTER MEMORY (L)
9	—	GND
10	I	SLP (H)
11	I	LP/SLP (H)
12	I	VDD
13	I	REEL FWD (H)/REV (L)
14	I	DEW (L)
15	I	SLOW (L)
16	I	THIN TAPE SW NOR (H)/THIN (L)
17	I	CAMERA REMOTE SW ON (H)
18	I	COUNTER MEMORY SW ON (H)
19	I	COUNTER RESET SW ON (H)
20	—	NOT USED
21	I	OSC
22	—	GND
23	I	VLC 3 ⎫
24	I	VLC 2 ⎬ MEMORY BACK UP
25	I	VLC 1 ⎭
26	I	VDD
27	—	NOT USED
28	O	COM 2
29	O	COM 1
30	O	COM 0
31	O	SEGMENT 23
32	O	SEGMENT 22
33	O	SEGMENT 21
34	O	SEGMENT 20
35	O	SEGMENT 19
36	O	SEGMENT 18

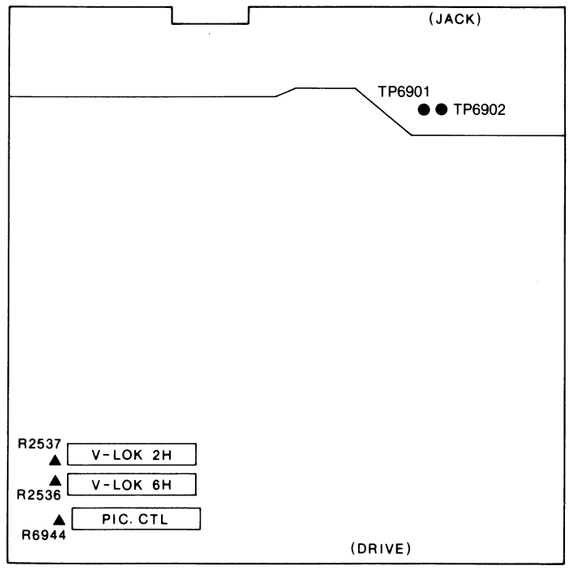
MICROCOMPUTER (IC6001: μPD7503G) I/O CHART

PIN	I/O	NAME/OPERATION
1	—	NOT USED
2	O	BATTERY REMAIN (1)
3	O	DEW/UNDER CUT/CYL LOCK/REEL LOCK (L)
4	—	NOT USED
5	I	SERIAL DATA (2)
6	O	SERIAL DATA (2)
7	I	SERIAL CLOCK (2)
8	O	COUNTER MEMORY (L)
9	—	GND
10	I	SLP (H)
11	I	LP/SLP (H)
12	I	VDD
13	I	REEL FWD (H)/REV (L)
14	I	DEW (L)
15	I	SLOW (L)
16	I	THIN TAPE SW NOR (H)/THIN (L)
17	I	CAMERA REMOTE SW ON (H)
18	I	COUNTER MEMORY SW ON (H)
19	I	COUNTER RESET SW ON (H)
20	—	NOT USED
21	I	OSC
22	—	GND
23	I	VLC 3 ⎫
24	I	VLC 2 ⎬ MEMORY BACK UP
25	I	VLC 1 ⎭
26	I	VDD
27	—	NOT USED
28	O	COM 2
29	O	COM 1
30	O	COM 0
31	O	SEGMENT 23
32	O	SEGMENT 22
33	O	SEGMENT 21
34	O	SEGMENT 20
35	O	SEGMENT 19
36	O	SEGMENT 18

PIN	I/O	NAME/OPERATION
37	O	SEGMENT 17
38	O	SEGMENT 16
39	O	SEGMENT 15
40	O	SEGMENT 14
41	O	SEGMENT 13
42	O	SEGMENT 12
43	O	SEGMENT 11
44	O	SEGMENT 10
45	O	SEGMENT 9
46	O	SEGMENT 8
47	O	SEGMENT 7
48	O	SEGMENT 6
49	O	SEGMENT 5
50	O	SEGMENT 4
51	O	SEGMENT 3
52	O	SEGMENT 2
53	O	SEGMENT 1
54	O	SEGMENT 0
55	I	CTL PULSE
56	I	RESET
57	I	257kHz (CLOCK)
58	I	VDD
59	—	NOT USED
60	I	BATTERY REMAIN
61	I	HEAD SWITCHING SIGNAL
62	I	SUPPLY REEL PULSE
63	I	TAKE UP REEL PULSE
64	O	BATTERY REMAIN (2)

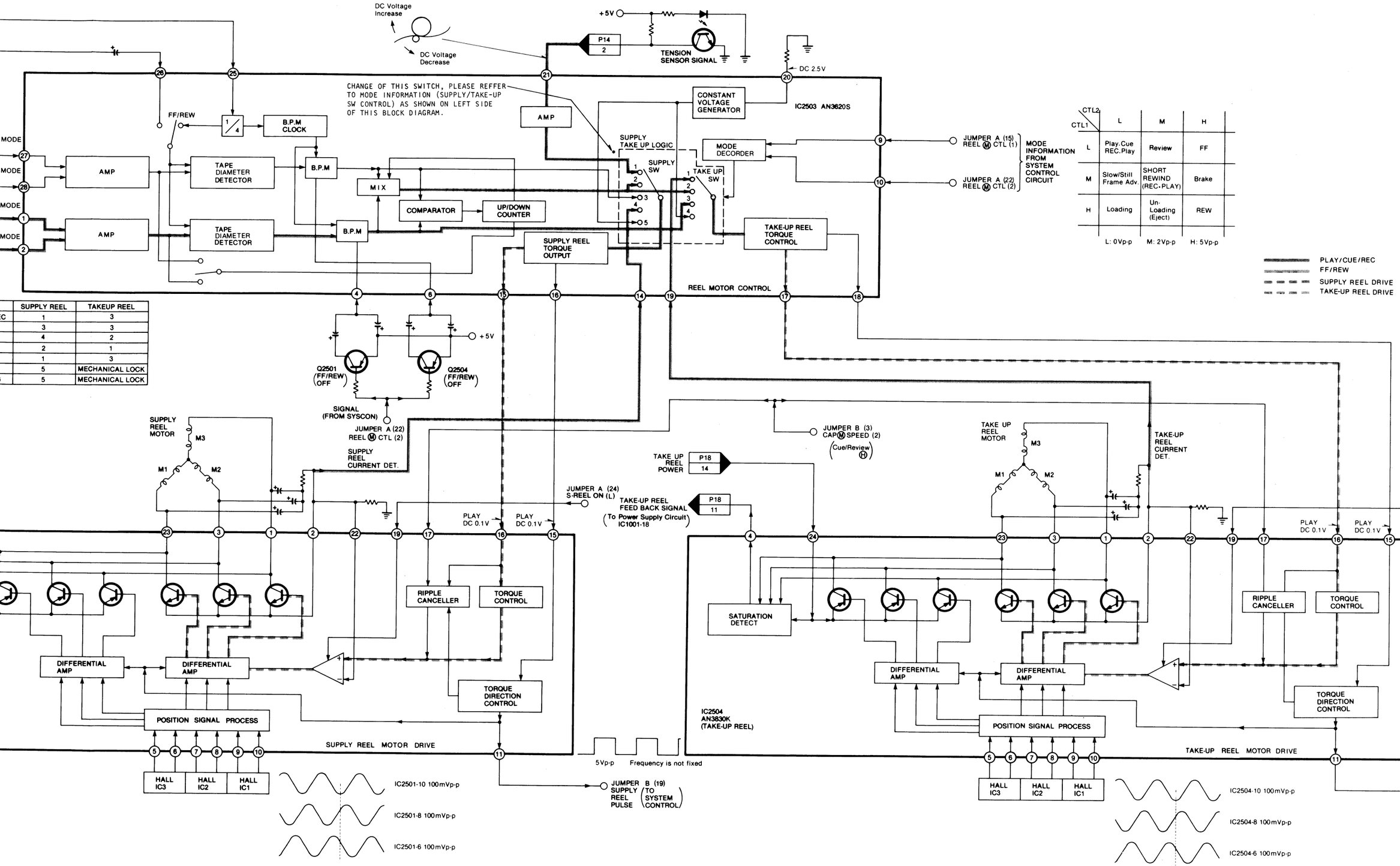
REEL SERVO BLOCK DIAGRAM





MODE	SUPPLY REEL	TAKEUP REEL
PLAY/CUE/REC	1	3
REVIEW	3	3
FF	4	2
REW	2	1
SLOW	1	3
LOADING	5	MECHANICAL LOCK
UNLOADING	5	MECHANICAL LOCK

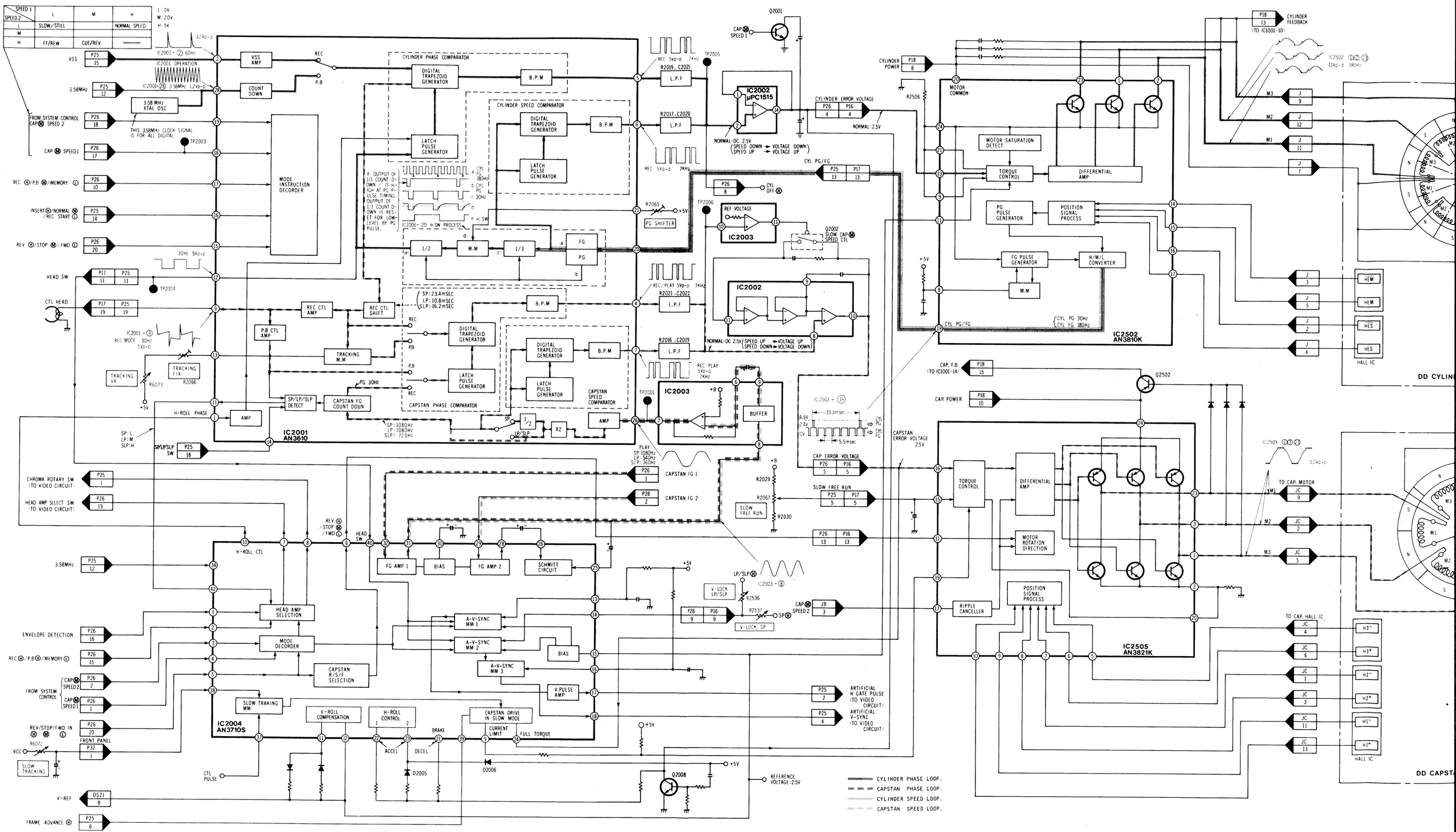
CK DIAGRAM

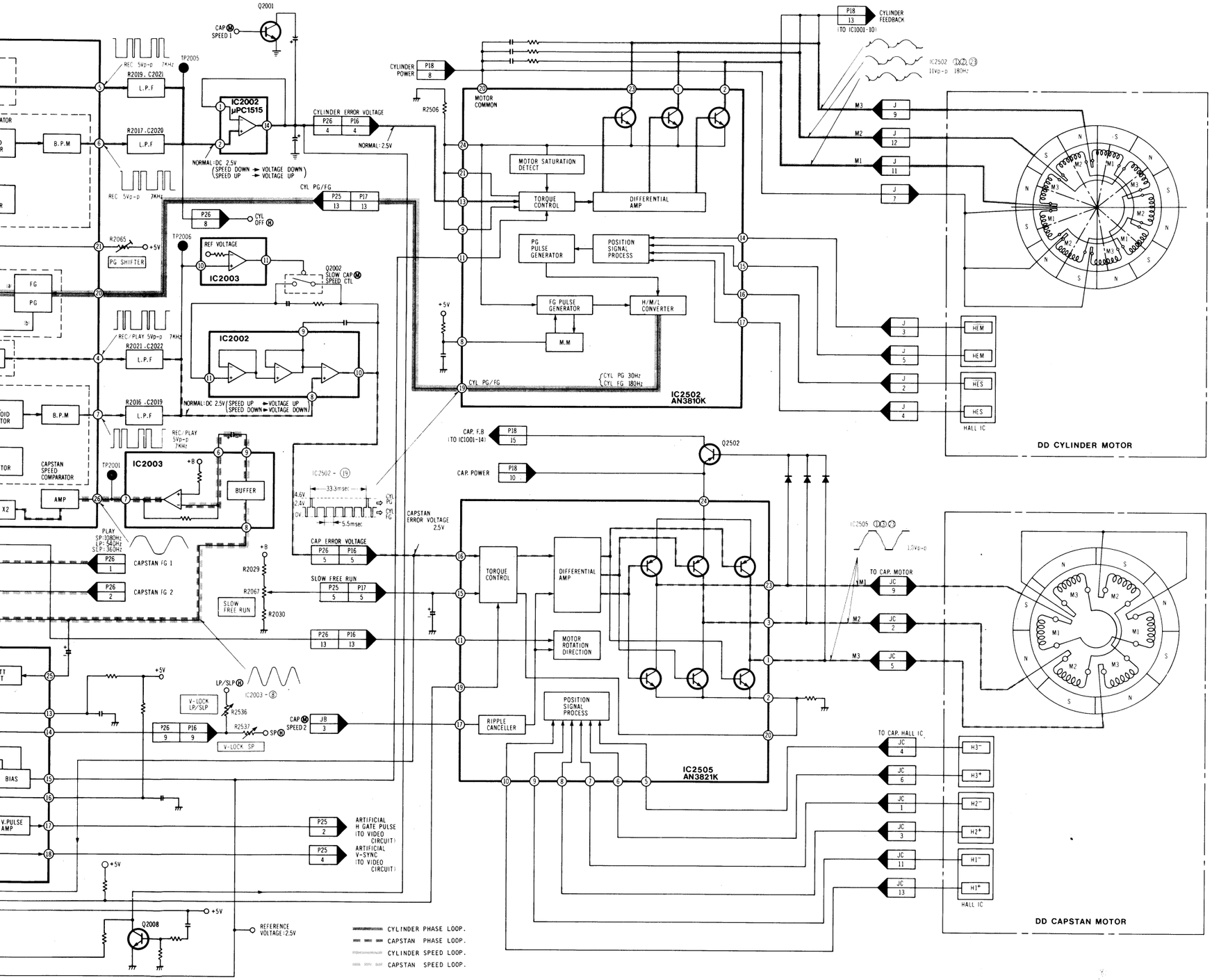


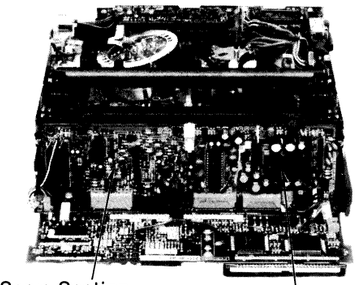
CTL2 / CTL1	L	M	H
L	Play.Cue REC.Play	Review	FF
M	Slow/Still Frame Adv.	SHORT REWIND (REC.PLAY)	Brake
H	Loading	Un-Loading (Eject)	REW
	L: 0Vp-p	M: 2Vp-p	H: 5Vp-p

	SUPPLY REEL	TAKEUP REEL
EC	1	3
	3	3
	4	2
	2	1
	1	3
	5	MECHANICAL LOCK
	5	MECHANICAL LOCK

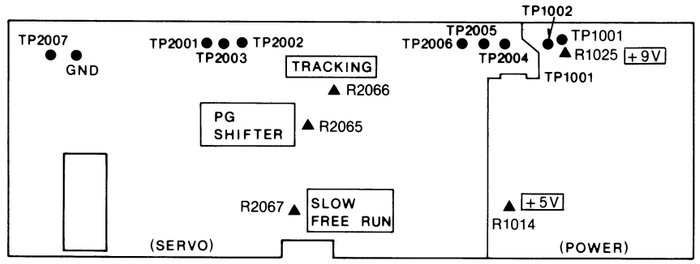
SERVO BLOCK DIAGRAM

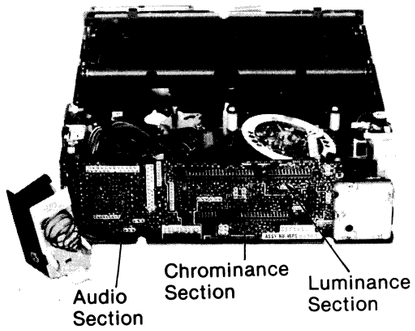


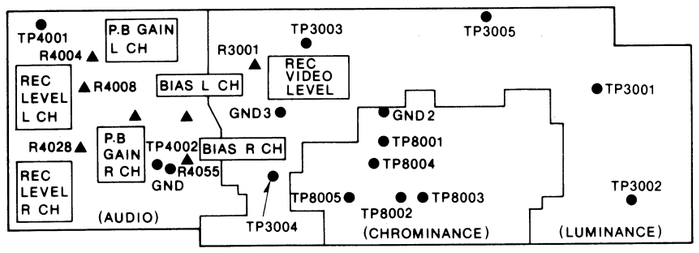




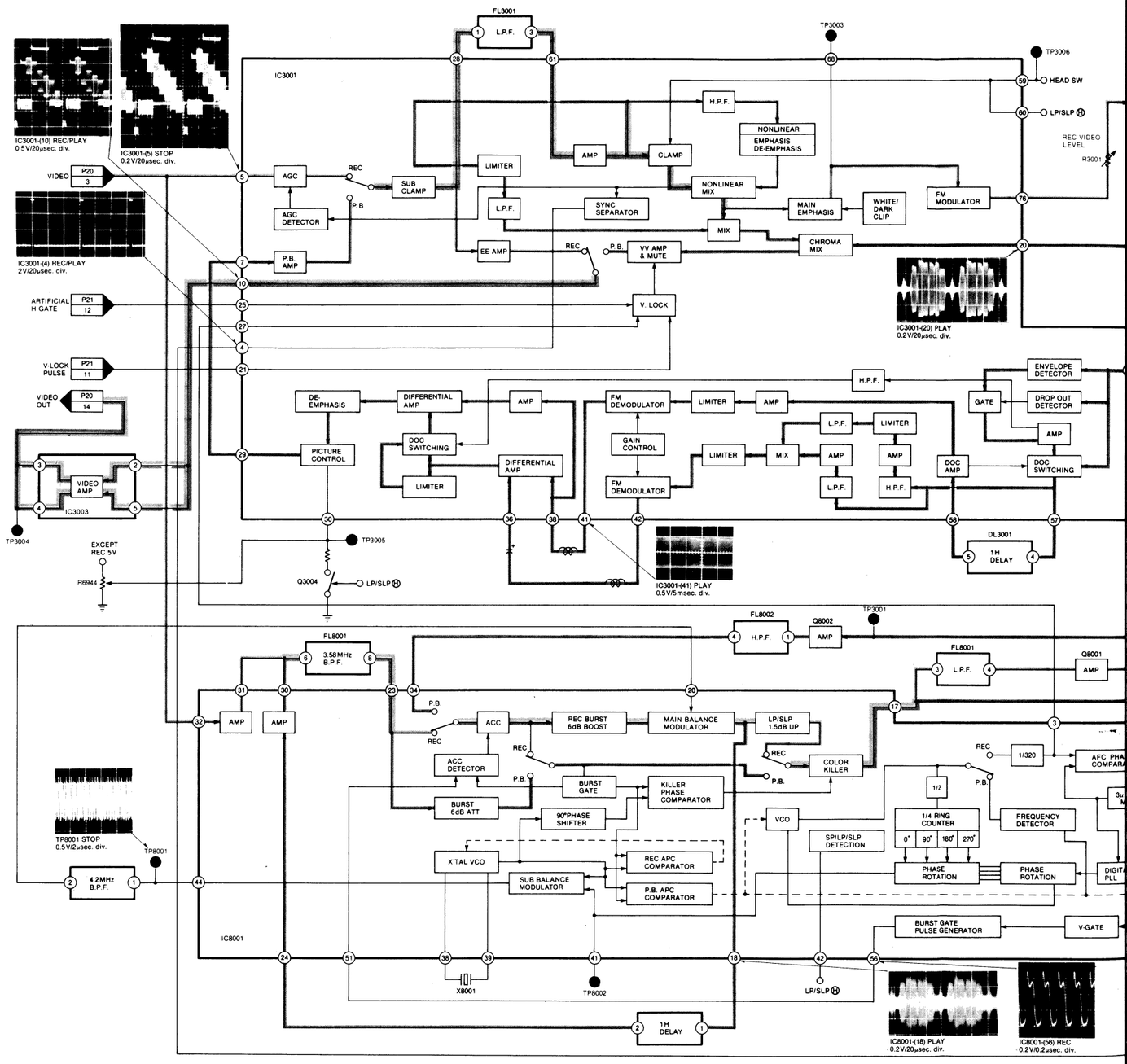
Servo Section A.V.R Section



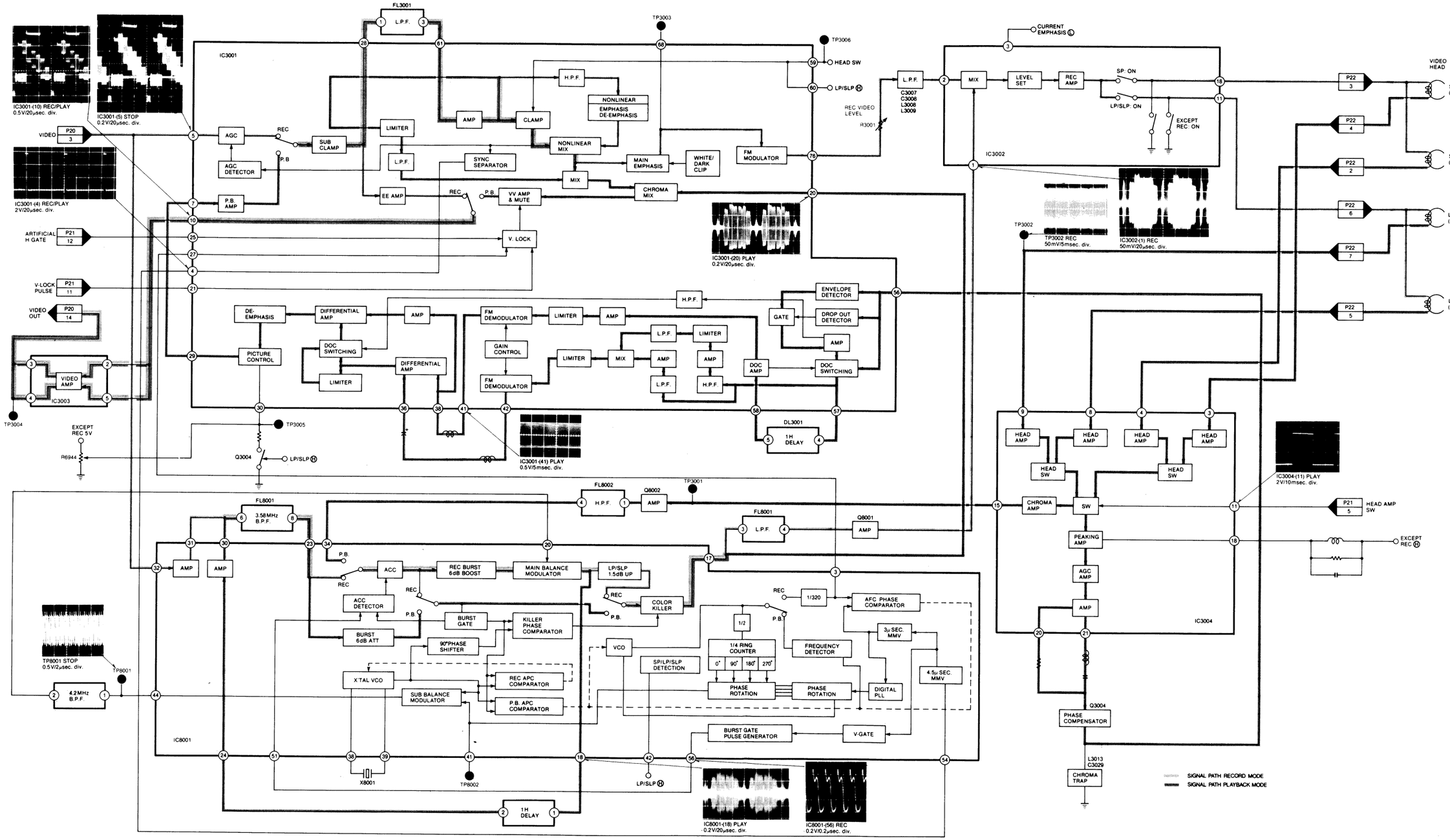




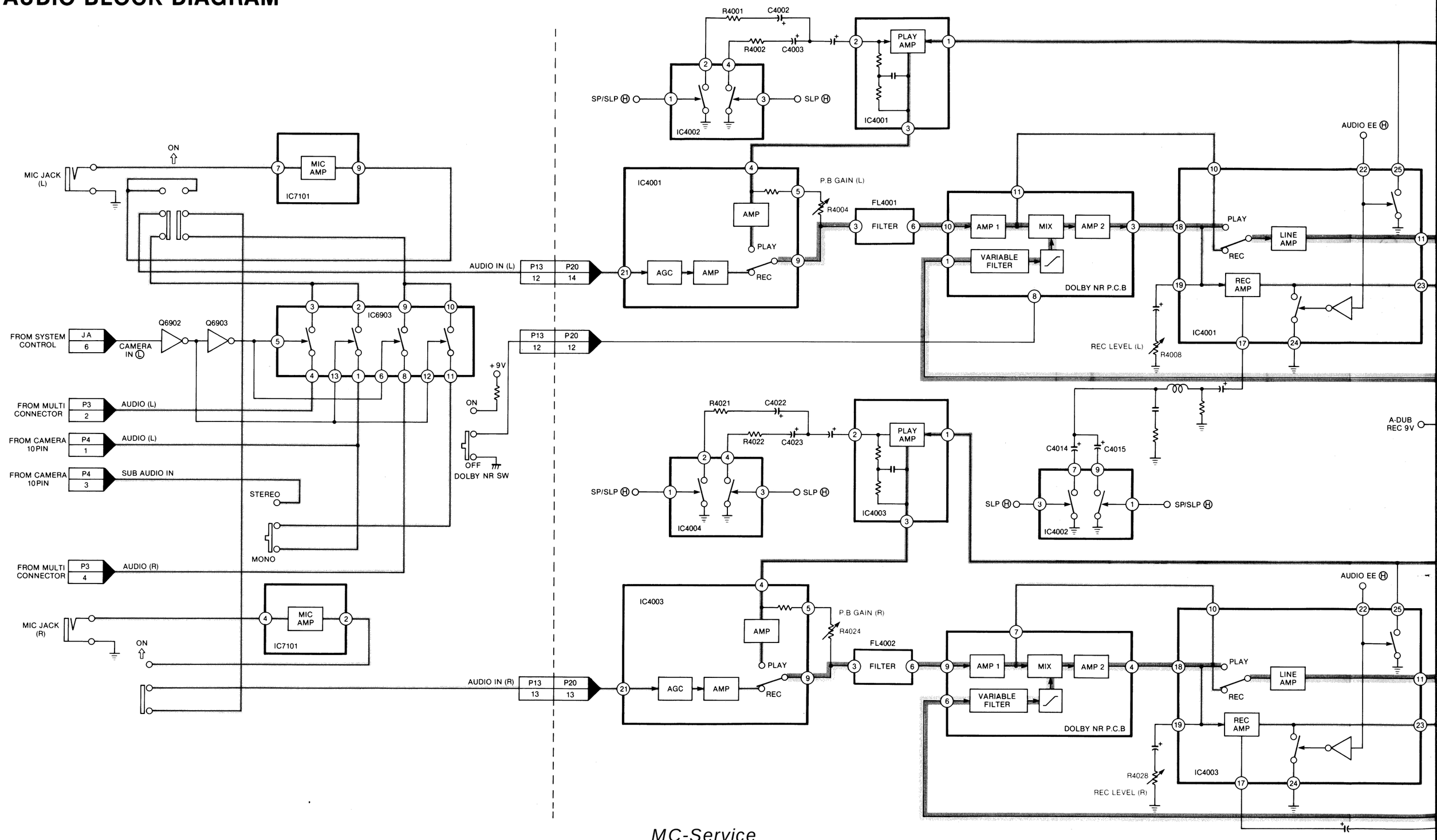
LUMINANCE & CHROMINANCE BLOCK DIAGRAM

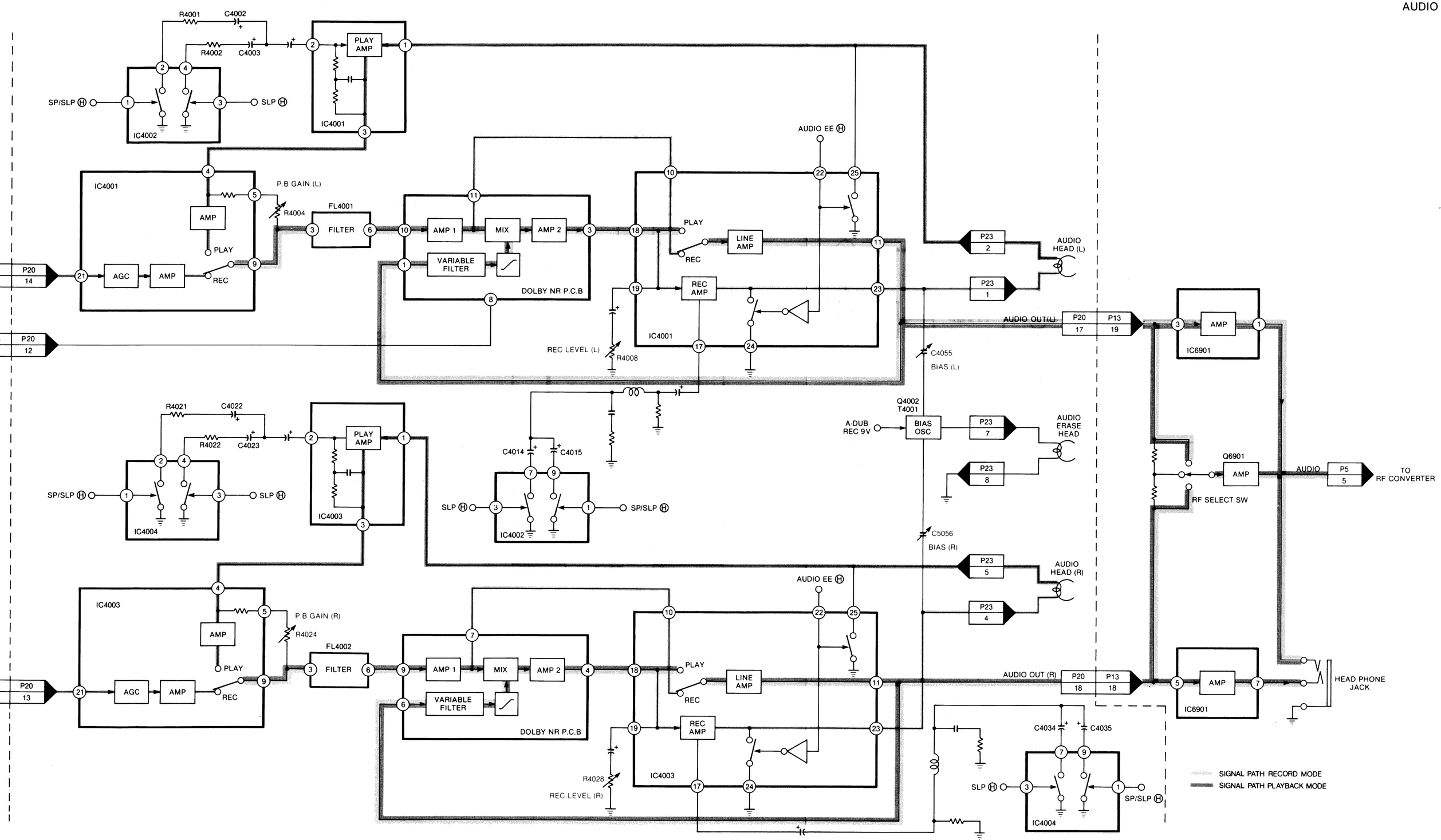


LUMINANCE & CHROMINANCE BLOCK DIAGRAM

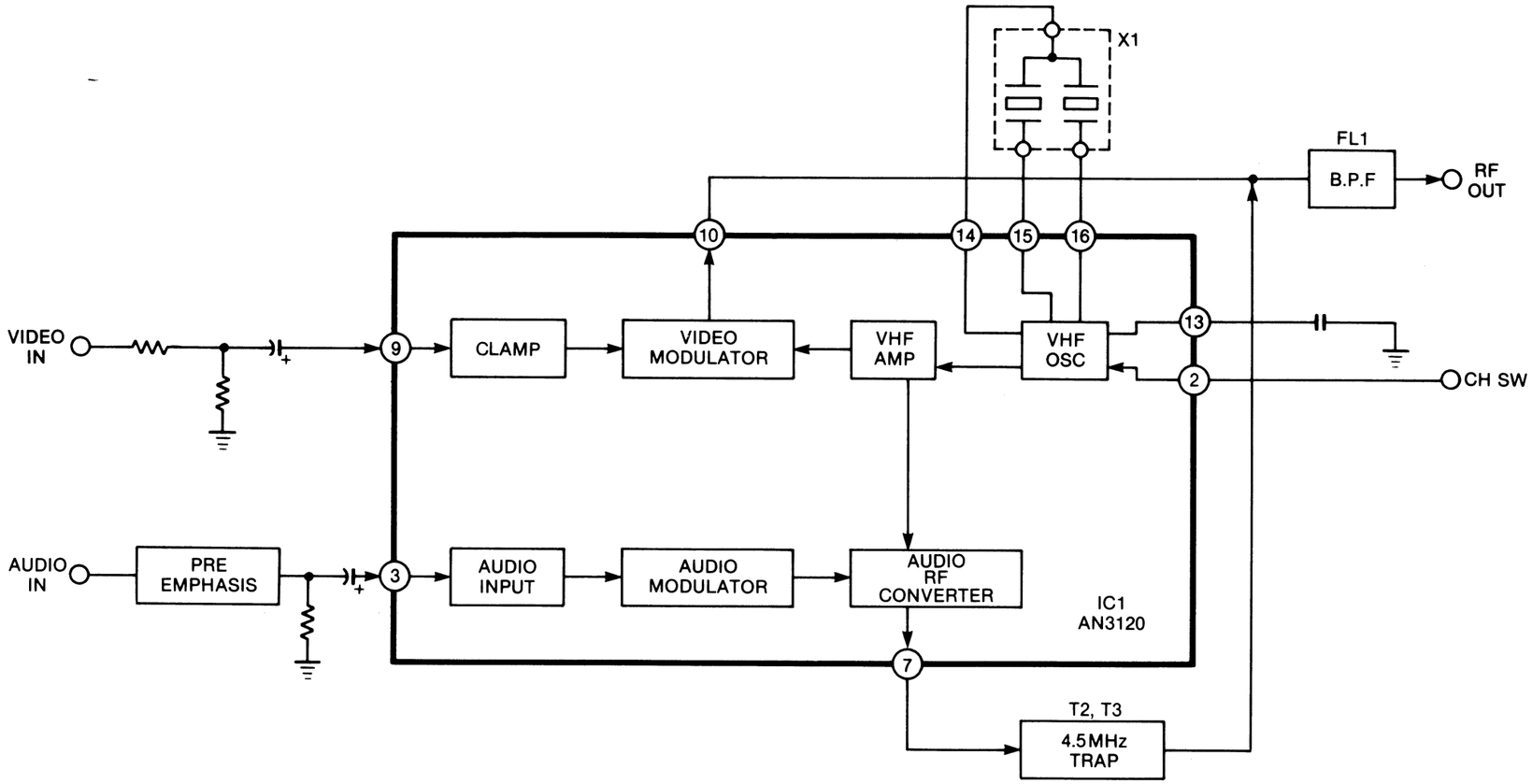


AUDIO BLOCK DIAGRAM




R4001
C4002
R4002
C4003
PLAY AMP
SP/SLP Ⓗ
SLP Ⓗ
IC4002
IC4001
IC4001
AMP
PLAY
REC
AGC
AMP
P.B GAIN (L)
R4004
FL4001
FILTER
AMP 1
MIX
AMP 2
VARIABLE FILTER
DOLBY NR P.C.B
AUDIO EE Ⓗ
LINE AMP
REC AMP
P20
14
P20
12
REC LEVEL (L)
R4008
C4055
BIAS (L)
P23
2
P23
1
AUDIO HEAD (L)
AUDIO OUT(L)
P20
17
P13
19
IC6901
AMP
Q4002
T4001
A-DUB
REC 9V
BIAS OSC
P23
7
P23
8
AUDIO ERASE HEAD
Q6901
AMP
AUDIO
P5
5
TO RF CONVERTER
RF SELECT SW
R4021
C4022
R4022
C4023
PLAY AMP
IC4004
IC4003
C4014
C4015
IC4002
C5056
BIAS (R)
P23
5
P23
4
AUDIO HEAD (R)
IC4003
AMP
P.B GAIN (R)
R4024
FL4002
FILTER
AMP 1
MIX
AMP 2
VARIABLE FILTER
DOLBY NR P.C.B
AUDIO EE Ⓗ
LINE AMP
REC AMP
P20
13
R4028
REC LEVEL (R)
AUDIO OUT (R)
P20
18
P13
18
IC6901
AMP
HEAD PHONE JACK
C4034
C4035
IC4004
SIGNAL PATH RECORD MODE
SIGNAL PATH PLAYBACK MODE

RF CONVERTER BLOCK DIAGRAM (VEQS0256/ENC-16801)



ORDER NO. VRD-8403-507

Service Manual

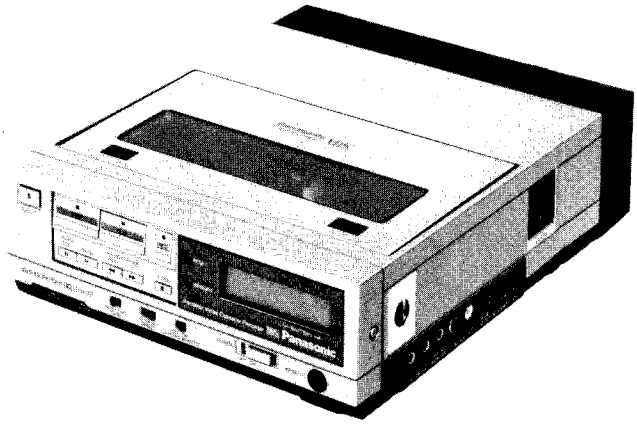
Video Cassette Recorder

Vol. 4

Panasonic Omnivision VHS

PV-8000

Schematic Diagrams
Printed Circuit Board Diagrams



SPECIFICATIONS

Power Source:	12V DC Battery PV-BP80 Prog. Tuner Unit PV-A820 PV-A850 PV-A860 Plug-in AC Adaptor PV-A118
Power Consumption:	Approx. 10 watts (16W with Camera)
Television System:	EIA Standard (525 lines, 60 fields) NTSC color signal
Video Recording System:	4 rotary heads, helical scanning system Luminance: FM azimuth recording Color signal: Converted subcarrier phase shift recording
Audio Track:	2 track
Tape Format:	Tape width 1/2″ (12.7mm), high density tape
Tape Speed:	SP mode: 1-5/16 i.p.s. (33.35mm/s) LP mode: 21/32 i.p.s. (16.67mm/s) SLP mode: 7/16 i.p.s. (11.12mm/s)
Record/Playback Time:	8 HRS. with 160 min. type tape used in SLP mode
FF/REW Time:	Less than 6 min. with 120 min. type tape
Heads:	Video: 4 rotary heads Audio: 2 stationary heads Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing
Input Level:	Video: VIDEO IN Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack (Left, Right) −70dB, 4kΩ unbalanced
Output Level:	Video: VIDEO OUT Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack (RCA type) −9dB, 600Ω unbalanced RF Modulated: Ch3/Ch4 switchable, 72dBμ, (Open Voltage) 75Ω unbalanced
Video Horizontal Resolution:	Color: more than 230 lines B/W: more than 230 lines
Audio Frequency Response: (10dB down)	SP mode: 100Hz~8kHz LP mode: 100Hz~6kHz SLP mode: 150Hz~5kHz
Signal-to-Noise Ratio:	Video: SP mode: better than 41dB LP mode: better than 41dB SLP mode: better than 41dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB LP mode: better than 40dB SLP mode: better than 40dB
Operation Temperature:	32°F—104°F (0°C—40°C)
Operating Humidity:	10%—75%
Weight:	5.7 lbs. (2.6kg)
Dimensions:	8-7/16″(W)×2-3/4″(D)×10-3/8″(H) (215mm×69.5mm×263mm)

Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

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MC-Service

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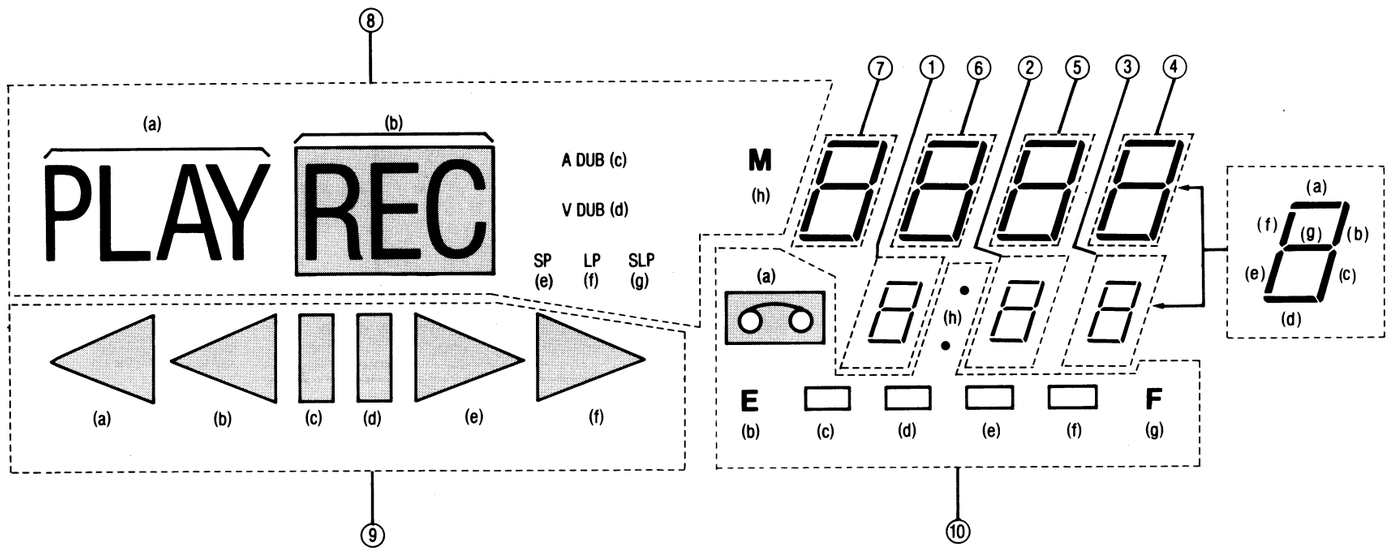
IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are shaded on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

SYSTEM CONTROL CIRCUIT

LIQUID CRYSTAL DISPLAY CONNECTION CHART



IC6002 KEY MATRIX CHART

DATA IN	SCAN OUT		
PIN NO.	58 (SCAN 1)	59 (SCAN 2)	60 (SCAN 3)
1 (DATA 1)	STOP	REC	PAUSE/STILL
64 (DATA 2)	EJECT	AUDIO DUB	———
63 (DATA 3)	REW/REVIEW	PLAY	———
62 (DATA 4)	FF/CUE	STOP	———

MC-Service

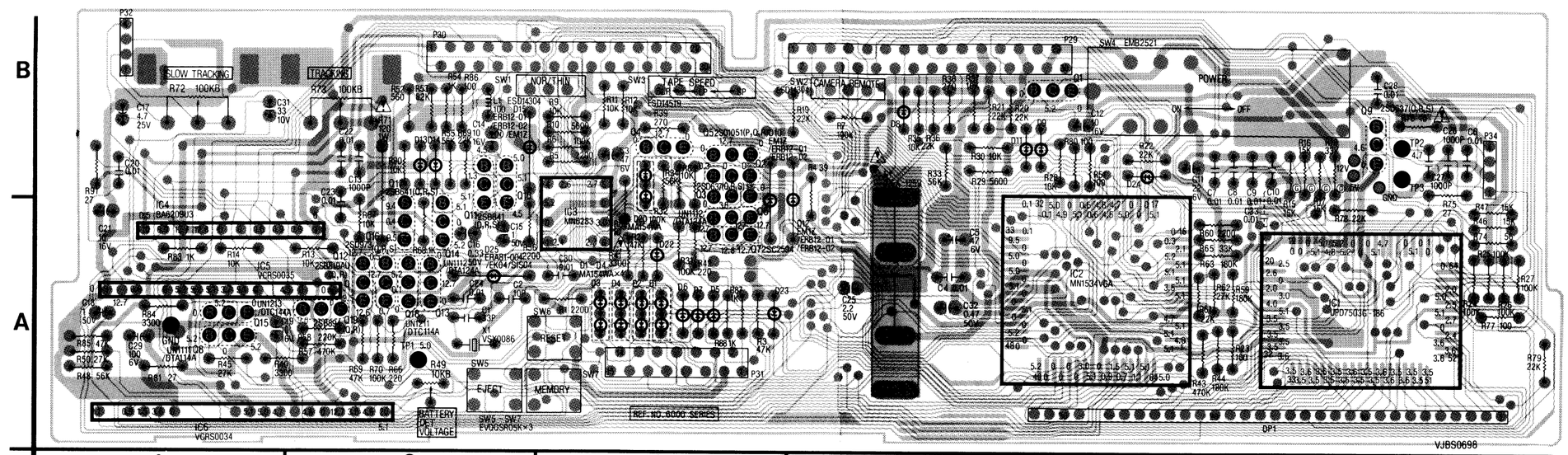
IC6001 PIN NO.		54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31
	PORT NO.	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23
28	C2	⑧-h	⑦-d	⑥-d	①-a	—	⑤-d	②-a	⑧-e	④-d	③-a	⑧-f	⑩-g	⑩-f	⑩-e	⑩-d	⑩-h	⑩-c	⑩-b	⑩-a	⑨-f	⑨-e	⑧-g	⑨-d	⑨-b
29	C1	⑦-e	⑦-g	⑥-g	⑥-c	⑤-e	⑤-g	⑤-c	④-e	④-g	④-c	③-b	③-g	③-f	②-b	②-g	②-f	①-b	①-g	①-f	⑥-e	⑦-c	⑧-d	⑨-c	⑨-a
30	C0	⑦-f	⑦-a	⑥-a	⑥-b	⑤-f	⑤-a	⑤-b	④-f	④-a	④-b	③-c	③-d	③-e	②-c	②-d	②-e	①-c	①-d	①-e	⑥-f	⑦-b	⑧-c	⑧-a	⑧-b

SYSTEM CONTROL C.B.A. VEPS0698A

VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN SP REC MODE.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.



SYSTEM CONTROL C.B.A.	
Q1	5-B
Q2	3-B
Q3	3-A
Q4	3-B
Q5	3-B
Q6	3-A
Q7	3-A
Q8	1-A
Q9	6-B
Q10	2-B
Q11	2-B
Q12	2-A
Q13	2-A
Q14	2-A
Q15	1-A
Q16	2-A
Q17	2-A
Q18	2-A
Q19	2-A

UNLESS OTHERWISE SPECIFIED:
TRANSISTORS ARE 2SD636(Q,R,S),
DIODES ARE MA165/1SS119 AND
WATTAGE OF RESISTORS ARE 1/4W.

P29

1	SLP Ⓗ/LP Ⓜ/SLP Ⓛ
2	SP/LP/SLP SW
3	CAP Ⓜ SPEED (2)
4	CAP Ⓜ SPEED (1)
5	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
6	TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
7	HEAD SW
8	CAP Ⓜ SLOW/STILL/STOP Ⓛ
9	CTL PULSE
10	AUDIO EE Ⓗ
11	SERIAL CLK (2)
12	CAP Ⓜ REV Ⓗ /STOP Ⓜ/FWD Ⓛ
13	CYL ON Ⓛ
14	SAFETY TAB Ⓛ
15	STAND BY
16	3.58MHz
17	SLOW/F ADV Ⓗ
18	SAFETY TAB/CHARGE
19	SUPPLY REEL PULSE
20	EXT +12V
21	GND
22	GND
23	SERIAL DATA (2)
24	TAKEUP REEL PULSE
25	+12V
26	+12V
27	TAKEUP PHOTO TR
28	BATTERY CHARGE
29	BATTERY CHARGE
30	CASSETTE UP Ⓗ/DOWN Ⓛ

P30

1	LOADING Ⓜ UNLOAD Ⓗ
2	DEW SENSOR
3	CAMERA PAUSE
4	+9V
5	SERIAL DATA (1)
6	CAMERA IN
7	EE Ⓗ
8	SENSOR LED
9	LOADING Ⓜ LOAD Ⓗ
10	VIDEO IN/OUT
11	SERIAL CLK (1)/TALLY Ⓛ
12	MAIN BRAKE
13	CURRENT EMPHA ON Ⓛ
14	VIDEO REC Ⓛ
15	REEL Ⓜ CTL (1)
16	CAMERA STAND BY /TIMER SET Ⓗ
17	SCAN 3
18	+5V
19	DATA IN 4
20	TAKEUP REEL Ⓜ ON Ⓛ
21	FULL ERASE Ⓛ
22	REEL Ⓜ CTL (2)
23	AUDIO REC Ⓛ
24	SUPPLY REEL Ⓜ ON Ⓛ
25	REC Ⓛ
26	DATA IN 3
27	VIDEO EE Ⓗ
28	SUPPLY PHOTO TR
29	AUDIO MUTE Ⓗ
30	

P31

1	COUNTER MEMORY
2	COUNTER RESET
3	+5V
4	SCAN 2
5	AUDIO DUB
6	REC
7	PLAY
8	SCAN 3
9	EJECT
10	STOP
11	SCAN 1
12	FF
13	REW
14	PAUSE
15	SLOW

P32

1	SLOW TRACKING
2	SLOW TRACKING
3	TRACKING
4	BRAKE BACKUP

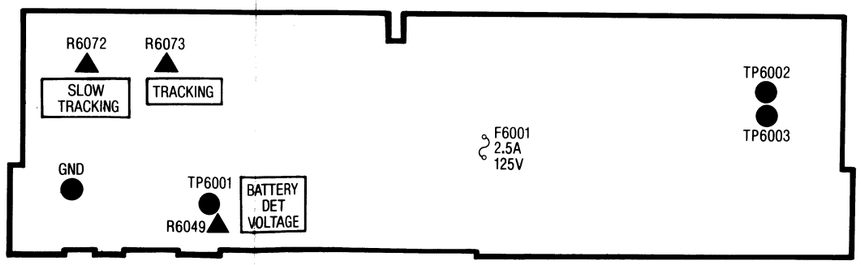
P34

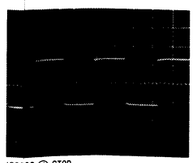
1	SERIAL DATA (2)
2	GND
3	SERIAL CLK (2)
4	+5V

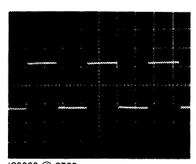
JUMPER

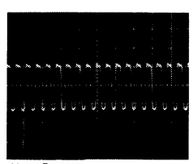
1	GND
2	+12V
3	+5V

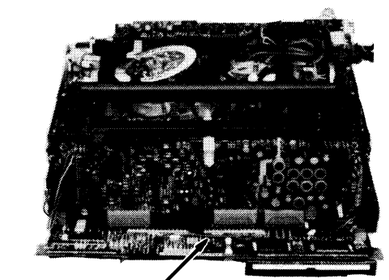
LOCATION OF TEST POINTS & ADJUSTMENT POINTS




IC6003 ④ STOP
2V/10μsec. div.


IC6003 ⑤ STOP
2V/1μsec. div.


IC6003 ⑦ STOP
2V/0.5μsec. div.


SYSTEM CONTROL C.B.A.

REF.NO. / MODE	IC6003								IC6004									
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	9	10
STOP	2.4	0	5.2	2.6	2.7	0	3.0	2.3	0	0.5	0.9	0.6	0	0	12.8	12.8	0.9	0.6
FF	2.4	0	5.2	2.6	2.7	0	3.0	2.3	0	0.5	0.9	0.6	0	0	12.7	12.7	0.9	0.5
REW	2.4	0	5.2	2.6	2.7	0	3.0	2.3	0	0.5	0.8	0.5	0	0	12.7	12.7	0.9	0.5
REC	2.4	0	5.2	2.6	2.7	0	3.0	2.3	0	0.6	0.9	0.6	0	0	12.8	12.7	0.9	0.5
PLAY	2.4	0	5.2	2.6	2.6	0	3.0	2.3	0	0.5	0.9	0.6	0	0	12.7	12.7	0.9	0.5
CUE	2.3	0	5.2	2.6	2.7	0	3.0	2.3	0	0.5	0.8	0.6	0	0	12.6	12.6	0.9	0.5
REV	2.3	0	5.2	2.6	2.7	0	3.0	2.3	0	0.5	0.8	0.6	0	0	12.5	12.5	0.9	0.5
SLOW(1/4)	2.3	0	5.2	2.6	2.7	0	3.0	2.3	0	0.5	0.8	0.6	0	0	12.6	12.7	0.9	0.5
F.A	2.3	0	5.2	2.6	2.7	0	3.0	2.3	0	0.5	0.8	0.6	0	0	12.7	12.7	0.9	0.5

REF.NO. / MODE	IC6005															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
STOP	0	12.8	0.6	★	0	5.2	5.2	5.1	3.7	5.1	0	★	4.5	0	★	0
FF	0	12.7	0.6	★	0	5.2	5.1	5.1	3.6	5.1	0	★	4.5	0	★	0
REW	0	12.7	0.6	★	0	5.2	5.1	5.1	3.6	5.1	0	★	4.5	0	★	0
REC	0	12.7	0.6	★	0	5.2	5.2	5.1	3.7	5.1	0	★	4.5	0	★	0
PLAY	0	12.7	0.6	★	0	5.2	5.2	5.1	3.7	5.1	0	★	4.5	0	★	0
CUE	0	12.6	0.6	★	0	5.2	5.1	5.0	3.6	5.0	0	★	4.4	0	★	0
REV	0	12.5	0.6	★	0	5.1	5.1	5.0	3.6	5.1	0	★	4.4	0	★	0
SLOW(1/4)	0	12.6	0.6	★	0	5.1	5.1	5.1	3.6	5.1	0	★	4.5	0	★	0
F.A	0	12.6	0.6	★	0	5.1	5.1	5.1	3.6	5.1	0	★	4.5	0	★	0

REF.NO. / MODE	IC6006																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	1.1	★	0.9	1.5	3.8	0	★	★	★	1.0	5.0	4.9	4.6	★	4.7	0	12.8	3.6	4.7	5.0
FF	2.8	★	0.8	1.4	4.3	0	★	★	★	2.7	5.0	4.9	4.6	★	4.8	0	12.7	3.6	4.6	5.0
REW	2.7	★	0.9	1.4	4.3	0	★	★	★	★	5.0	4.9	4.6	★	4.8	0	12.7	3.6	4.6	5.0
REC	★	★	0.9	1.5	3.8	0	★	★	★	★	5.1	5.0	4.7	★	4.8	0	12.7	3.6	4.6	5.1
PLAY	★	★	0.9	1.5	3.8	0	★	★	★	★	5.1	5.0	4.7	★	4.7	0	12.7	3.6	4.6	5.1
CUE	★	★	0.9	1.4	★	0	★	★	★	★	5.0	4.9	4.6	★	4.7	0	12.6	3.6	4.5	5.0
REV	★	★	0.8	1.4	★	0	★	★	★	★	5.0	4.9	4.6	★	4.7	0	12.5	3.6	4.5	5.0
SLOW(1/4)	4.6	★	0.8	1.4	4.7	0	★	★	★	0.9	5.0	4.9	4.6	★	4.8	0	12.6	3.6	4.5	5.1
F.A	0.8	★	0.8	1.4	4.6	0	★	★	★	4.5	5.1	4.9	4.6	★	4.7	0	12.7	3.6	4.6	5.0

REF.NO. / MODE	Q6001			Q6002			Q6003			Q6004			Q6005			Q6006			Q6007		
	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
STOP	0	0	5.2	0	0.3	0	0	0	3.9	0	0	12.8	0	0	12.8	12.8	12.8	12.8	12.8	12.8	12.8
FF	0	0	5.2	0	0.3	0	0	0	3.8	0	0	12.7	0	0	12.7	12.7	12.7	12.7	12.7	12.7	12.7
REW	0	0	5.1	0	0.3	0	0	0	3.8	0	0	12.7	0	0	12.7	12.7	12.7	12.7	12.7	12.7	12.7
REC	0	0	5.2	0	0.3	0	0	0	3.8	0	0	12.7	0	0	12.7	12.7	12.7	12.7	12.7	12.7	12.8
PLAY	0	0	5.2	0	0.3	0	0	0	3.9	0	0	12.8	0	0	12.7	12.7	12.7	12.7	12.7	12.7	12.8
CUE	0	0	5.2	0	0.3	0	0	0	3.8	0	0	12.6	0	0	12.6	12.6	12.6	12.6	12.6	12.6	12.6
REV	0	0	5.2	0	0.3	0	0	0	3.8	0	0	12.6	0	0	12.5	12.6	12.5	12.5	12.5	12.5	12.6
SLOW(1/4)	0	0	5.2	0	0.3	0	0	0	3.8	0	0	12.7	0	0	12.6	12.7	12.6	12.7	12.7	12.6	12.7
F.A	0	0	5.1	0	0.3	0	0	0	3.8	0	0	12.7	0	0	12.6	12.7	12.6	12.7	12.7	12.7	12.7

REF.NO. / MODE	Q6008			Q6009			Q6010			Q6011			Q6012			Q6013			Q6014		
	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
STOP	5.2	5.2	0	0	★	1.0	4.4	5.0	5.0	5.0	4.4	1.3	12.7	12.8	0	0	0	12.8	5.2	5.0	0
FF	5.2	5.2	0	0	0.3	2.7	4.4	5.0	5.0	5.0	4.4	1.4	12.6	12.7	0	0	0	12.7	5.2	5.0	0
REW	5.2	5.2	0	0	0.3	2.7	4.4	5.0	5.0	5.0	4.4	1.4	12.5	12.7	0	0	0	12.7	5.2	5.0	0
REC	5.2	5.2	0	0	★	4.6	4.5	5.0	5.1	5.1	4.5	1.3	12.6	12.7	0	0	0	12.7	5.2	5.1	0
PLAY	5.2	5.2	0	0	★	4.6	0	0	0	0	0	0	12.6	12.7	0	0	0	12.7	5.2	5.0	0
CUE	5.2	5.1	0	0	★	★	0	0	0	0	0	0	12.5	12.6	0	0	0	12.6	5.2	5.0	0
REV	5.2	5.1	0	0	★	★	0	0	0	0	0	0	12.4	12.6	0	0	0	12.5	5.2	5.0	0
SLOW(1/4)	5.2	5.1	0	0	0.5	4.6	0	0	0	0	0	0	12.5	12.6	0	0	0	12.6	5.2	5.0	0
F.A	5.2	5.1	0	0	0	4.5	0	0	0	0	0	0	12.5	12.7	0	0	0	12.7	5.2	5.0	0

REF.NO. / MODE	Q6015			Q6016			Q6017			Q6018			Q6019		
	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
STOP	0	0	5.1	0.1	0	12.8	9.5	9.5	0	0	5.2	0.1	9.5	0	9.0
FF	0	0	5.1	8.8	9.5	12.7	9.5	0	9.5	0	5.2	0.1	9.5	0	9.0
REW	0	0	5.1	8.9	9.5	12.7	9.5	0	9.5	0	5.2	0.1	9.5	0	9.0
REC	0	0	5.2	0.7	0.5	12.7	9.5	9.4	0.4	0	5.2	0.1	9.5	0	9.0
PLAY	0	0	5.2	0.7	0.6	12.7	9.5	9.4	0.6	0	5.2	0.1	9.5	0	9.0
CUE	0	0	5.1	8.8	9.5	12.6	9.5	0	9.5	0	5.2	0.1	9.5	0	9.0
REV	0	0	5.1	8.9	9.5	12.5	9.5	0	9.5	0	5.2	0.1	9.5	0	9.0
SLOW(1/4)	0	0	5.1	0.6	0.4	12.6	9.5	9.4	0.4	0	5.2	0	9.5	0	9.0
F.A	0	0	5.1	0.8	0.6	12.7	9.5	9.4	0.4	0	5.2	0	9.5	0	9.0

REF.NO. / MODE	TP6001	TP6002	TP6003
STOP	5.0	4.6	1.0
FF	5.0	4.6	3.0
REW	5.0	4.6	2.9
REC	5.0	4.7	★
PLAY	5.1	4.7	★
CUE	5.1	4.6	★
REV	5.0	4.6	★
SLOW(1/4)	5.0	4.6	4.6
F.A	5.0	4.6	0.9

VOLTAGE MEASUREMENT:
1. CUE, REVIEW, FRAME ADVANCE, SLOW,
   COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
   COLOR BAR SIGNAL IN SP MODE.

★ : UNMEASURABLE OR UNNECESSARY TO MEASURE.

REF.NO. / MODE	IC6001																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0	0	5.1	0	3.8	3.9	4.6	5.1	0	0	0	5.1	5.1	4.7	5.1	5.1	0	0	0	2.5
FF	0	0	5.1	0	4.3	★	4.7	5.1	0	0	0	5.1	5.1	4.8	5.1	5.1	0	0	0	2.5
REW	0	0	5.1	0	4.3	★	4.7	5.2	0	0	0	5.1	0	4.8	5.1	5.1	0	0	0	2.5
REC	0	0	5.1	0	★	★	4.7	5.1	0	0	0	5.2	5.2	4.8	5.1	5.1	0	0	0	2.5
PLAY	0	0	5.1	0	★	★	4.7	5.1	0	0	0	5.1	5.1	4.8	5.1	5.1	0	0	0	2.5
CUE	0	0	5.2	0	★	★	4.6	5.2	0	0	0	5.1	5.1	4.8	5.2	5.1	0	0	0	2.5
REV	0	0	5.2	0	★	★	4.7	5.1	0	0	0	5.1	0	4.8	5.1	5.1	0	0	0	2.5
SLOW(1/4)	0	0	5.2	0	4.8	3.9	4.6	5.1	0	0	0	5.1	5.1	4.7	0	5.1	0	0	0	2.5
F.A	0	0	5.1	0	3.8	3.9	4.6	5.1	0	0	0	5.2	5.2	4.9	5.1	5.1	0	0	0	2.5

REF.NO. / MODE	IC6001																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	2.6	0	2.0	3.0	4.0	5.1	5.1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
FF	2.6	0	2.0	3.0	4.1	5.1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
REW	2.6	0	2.0	3.0	4.1	5.1	3.5	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
REC	2.6	0	2.0	3.0	4.0	5.1	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
PLAY	2.6	0	0	2.5	4.0	5.1	5.1	3.8	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.5	3.5	3.6	3.5	3.5
CUE	2.6	0	2.0	3.0	4.1	5.1	3.5	3.6	3.5	3.6	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.5	3.5
REV	2.6	0	2.0	2.5	4.1	5.2	3.5	3.6	3.5	3.5	3.7	3.5	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.5
SLOW(1/4)	2.6	0	2.0	3.0	4.1	5.1	3.5	3.6	3.5	3.5	3.5	3.6	3.5	3.6	3.6	3.5	3.6	3.6	3.6	3.5
F.A	2.6	0	2.0	3.0	4.0	5.1	3.5	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.6	3.6	3.6	3.5

REF.NO. / MODE	IC6001																			
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	0	0	2.7	5.1	2.5	5.0
FF	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	0	0	2.7	5.1	2.5	5.0
REW	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	0	0	2.7	5.1	2.5	5.1
REC	3.6	3.5	3.5	3.5	3.6	3.6	3.5	3.6	3.5	3.5	3.5	3.6	3.6	3.6	2.4	0	2.7	5.1	2.5	5.0
PLAY	3.6	3.5	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.5	0.3	0	2.6	5.1	2.5	5.1
CUE	3.6	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	0.9	0	2.7	5.1	2.5	5.0
REV	3.5	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	0.5	0	2.7	5.2	2.6	5.1
SLOW(1/4)	3.5	3.6	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.5	3.6	3.6	3.6	0	0	2.6	5.1	2.5	5.0
F.A	3.5	3.5	3.5	3.5	3.6	3.6	3.5	3.6	3.6	3.6	3.5	3.5	3.5	3.5	0	0	2.7	5.1	2.5	5.0

REF.NO. / MODE	IC6001			
	61	62	63	64
STOP	0	0	0	0
FF	0	2.6	2.6	0
REW	0	2.6	2.6	0
REC	2.0	★	★	0
PLAY	2.0	★	★	0
CUE	2.0	★	★	0
REV	2.0	★	★	0
SLOW(1/4)	2.0	★	★	0
F.A	2.0	0.1	0.1	0

REF.NO. / MODE	IC6002																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	5.0	4.0	5.0	5.0	4.7	0.6	3.8	5.1	3.5	5.1	5.1	5.1	5.2	2.1	0.3	0	5.1	0	0	0
FF	5.0	4.0	5.0	5.0	4.6	0.3	4.3	5.1	3.5	5.1	5.1	5.2	5.2	2.1	0.3	0	5.1	0	0	0
REW	5.0	4.0	5.0	5.0	4.6	0.3	4.3	5.1	3.5	5.1	5.1	5.1	5.2	2.1	0.3	0	5.1	0	0	0
REC	5.1	4.0	5.1	5.1	4.7	★	★	5.1	3.5	5.1	5.1	5.1	5.2	2.1	0.3	0	5.1	0	0	0
PLAY	5.1	★	5.1	5.1	4.7	★	★	5.1	3.5	5.1	5.1	5.1	5.2	2.1	0.3	0	5.1	0	0	0
CUE	5.0	4.0	5.0	5.0	4.6	★	★	5.1	3.5	5.1	5.1	5.1	5.2	2.1	0.3	0	5.1	0	0	0
REV	5.0	3.9	5.0	5.0	4.6	★	★	5.1	3.5	5.1	5.1	5.1	5.2	2.1	0.3	0	5.1	0	0	0
SLOW(1/4)	5.0	4.0	5.0	5.0	4.6	★	★	5.1	3.5	5.1	5.1	5.0	5.2	2.1	0.3	0	5.2	0	0	1.4
F.A	5.0	4.0	5.0	5.0	4.6	0.6	3.8	5.1	3.5	5.1	5.1	5.1	5.2	2.1	0.3	0	5.2	0	0	★

REF.NO. / MODE	IC6002																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	4.9	4.6	4.5	3.8	0	0.6	0	0	4.8	4.9	9.5	9.5	9.5	9.5	5.0	0	2.1	5.0	2.1	0
FF	4.9	4.6	4.5	4.3	0	0.6	5.0	0	4.8	5.0	9.5	9.5	9.5	0	5.0	0	2.1	5.0	1.9	0
REW	4.9	4.7	4.5	4.3	0	0.6	5.0	0	4.8	5.0	9.5	9.5	9.5	0	4.9	0	2.1	5.0	2.1	0
REC	5.0	4.7	4.5	4.8	0.6	0.6	5.1	0	4.9	5.0	0.1	0.1	0.1	9.5	0	5.0	0	5.0	0	5.1
PLAY	5.0	4.7	4.5	★	0.6	0.6	0	0	0	0	9.5	9.5	9.5	9.4	0	5.0	0	2.1	2.1	5.1
CUE	4.9	4.6	4.5	★	0.6	0.6	0	4.4	0	0	9.5	9.5	9.5	0	4.9	2.1	0	2.1	2.1	5.0
REV	4.9	4.6	4.5	★	0.6	0.6	0	4.4	0	0	9.5	9.5	9.5	0	4.9	2.1	5.0	0	2.1	5.0
SLOW(1/4)	4.9	4.6	4.5	★	0.6	0.6	0	4.4	0	0	9.5	9.5	9.5	9.5	0	0	0	0	2.1	0
F.A	4.9	4.6	4.5	4.7	0.6	0.6	0	4.4	0	0	9.5	9.5	9.5	9.4	0	0	0	0	2.1	0

REF.NO. / MODE	IC6002																			
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	2.1	5.0	5.1	4.5	5.0	5.1	0	0	5.2	0	0	0	5.0	5.0	3.0	5.0	0	0.9	0	0.7
FF	0	5.0	5.1	4.5	5.0	5.1	0	0	5.2	0	0	0	0	0	3.0	5.0	0	0.9	1.5	0.7
REW	5.0	5.0	5.1	4.6	5.0	0	0	0	5.2	0	0	0	0	0	3.0	5.0	0	0.9	1.5	0.7
REC	0	0	5.1	0	0	5.2	0	0	5.2	0	0	0	0	0	3.0	5.1	0	0.9	1.5	0.7
PLAY	0	0	5.1	4.5	0	5.1	0	0	5.2	0	0	0	0	0	3.0	5.0	0	0.9	1.5	0.7
CUE	0	0	5.1	4.6	0	5.2	0	0	5.2	0	0	0	0	0	3.0	5.0	0	0.9	1.5	0.7
REV	0	2.1	5.1	4.5	0	0	0	0	5.2	0	0	0	0	0	3.0	5.0	0	0.9	1.5	0.7
SLOW(1/4)	2.1	0	0	4.6	0	5.1	0	0	5.2	0	0	0	0	0	3.0	5.0	0	0.9	1.5	0.7
F.A	2.1	0	5.1	4.5	0	5.2	0	0	5.2	0	0	0	0	0	3.0	5.0	0	0.9	1.4	0.7

REF.NO. / MODE	IC6002			
	61	62	63	64
STOP	0	1.1	1.1	5.0
FF	5.0	1.1	1.1	5.0
REW	5.0	1.1	1.1	5.0
REC	5.1	1.1	5.1	5.0
PLAY	5.0	1.1	5.1	5.0
CUE	5.0	1.1	5.0	5.0
REV	5.0	1.1	5.0	5.0
SLOW(1/4)	5.0	1.1	5.0	5.0
F.A	5.0	1.1	5.0	5.0

VOLTAGE MEASUREMENT:

1. CUE, REVIEW, FRAME ADVANCE, SLOW, COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
   COLOR BAR SIGNAL IN SP MODE.

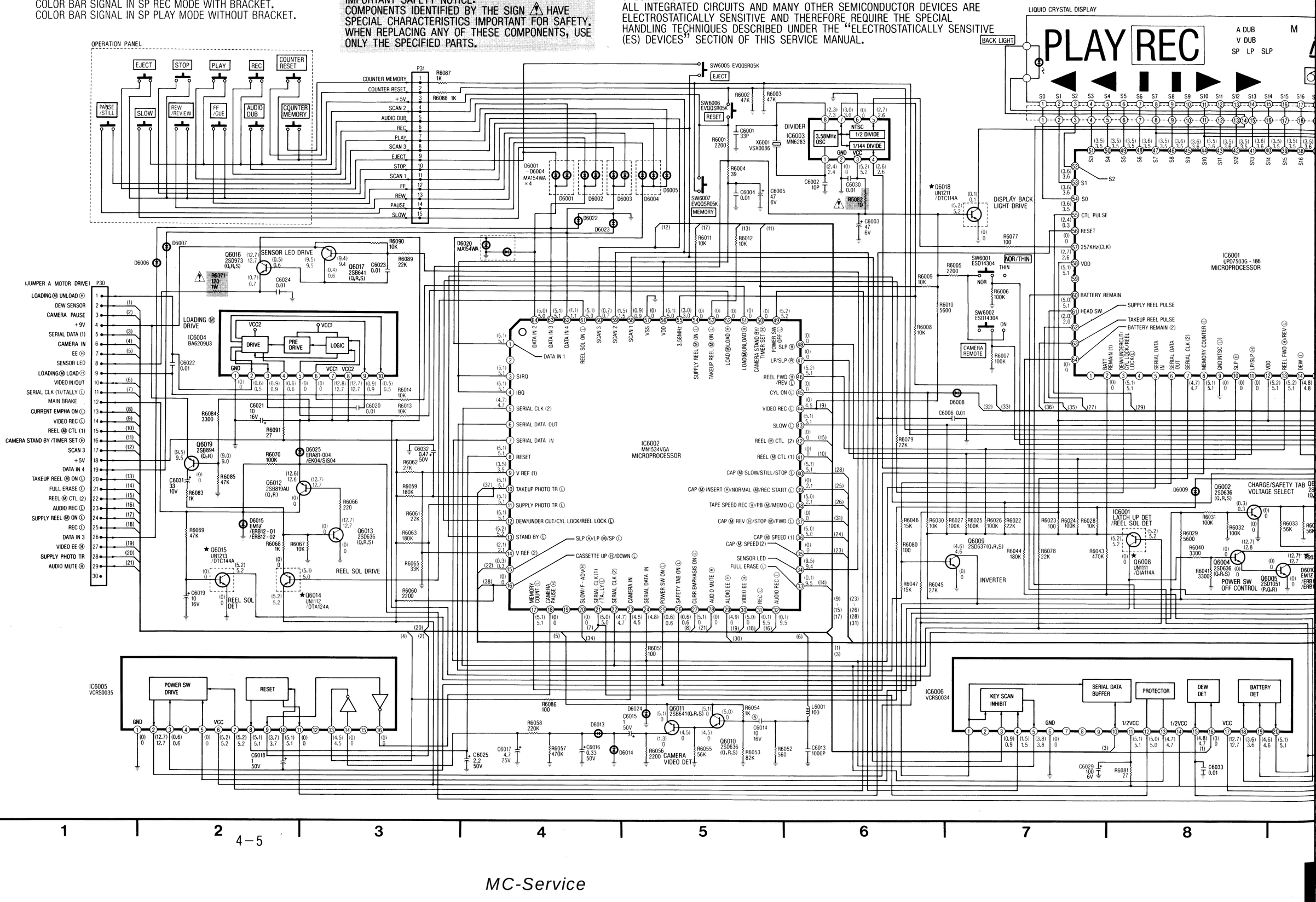
★ : UNMEASURABLE OR UNNECESSARY TO MEASURE.

SYSTEM CONTROL SCHEMATIC DIAGRAM

VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

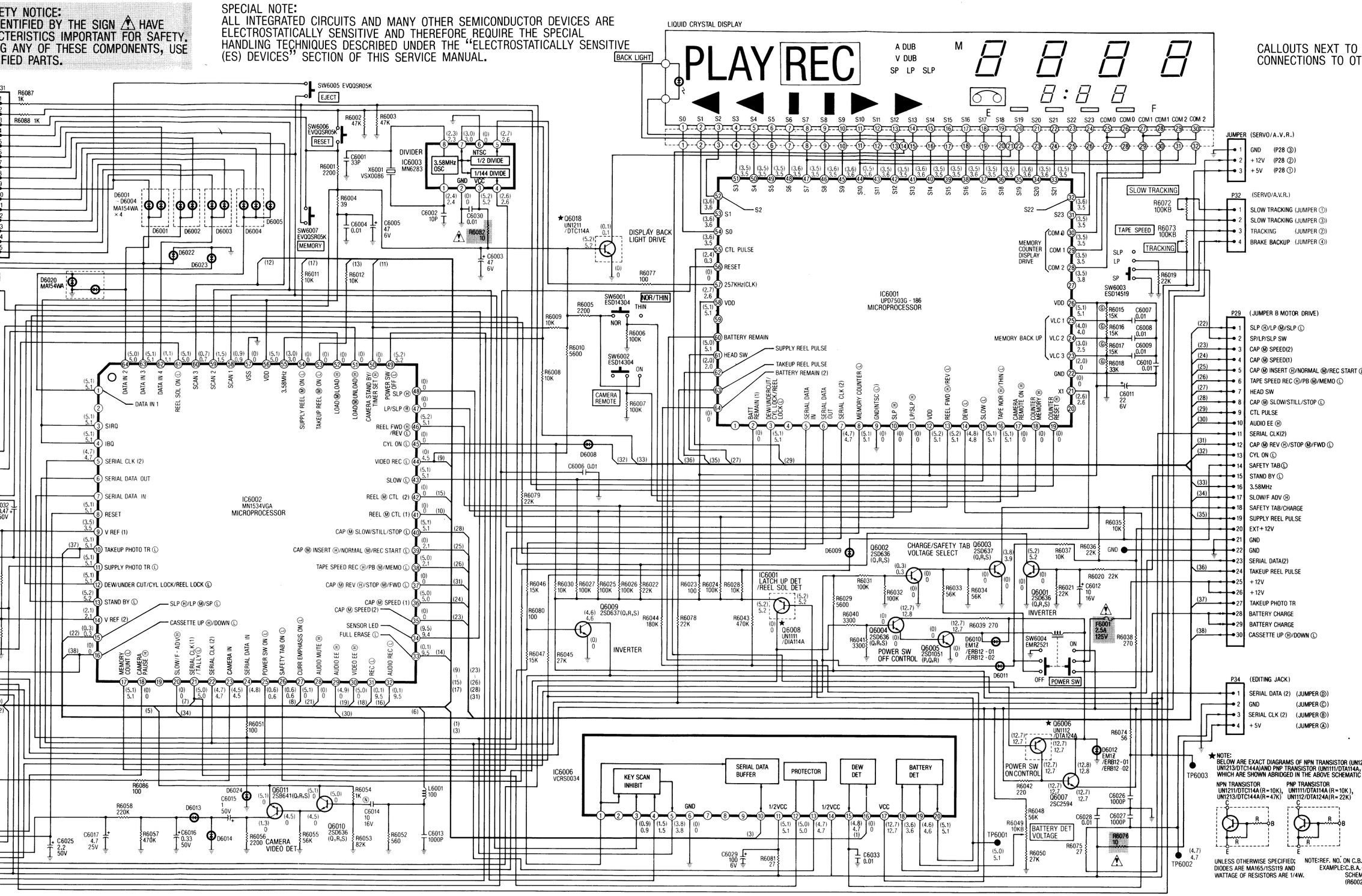


ETY NOTICE:
ENTIFIED BY THE SIGN ⚠ HAVE
CTERISTICS IMPORTANT FOR SAFETY.
G ANY OF THESE COMPONENTS, USE
FIED PARTS.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

SYSTEM CONTROL	
Q6001	9-B
Q6002	8-B
Q6003	9-B
Q6004	8-B
Q6005	9-B
Q6006	9-A
Q6007	9-A
Q6008	8-B
Q6009	7-B
Q6010	5-A
Q6011	5-A
Q6012	3-C
Q6013	3-B
Q6014	2-B
Q6015	2-B
Q6016	2-D
Q6017	3-D
Q6018	7-D
Q6019	2-C



★NOTE:
BELOW ARE EXACT DIAGRAMS OF NPN TRANSISTOR (UN1211/DTC114A, UN1213/DTC144A) AND PNP TRANSISTOR (UN1111/DTA114A, UN1112/DTA124A) WHICH ARE SHOWN ABRIDGED IN THE ABOVE SCHEMATIC DIAGRAM.

NPN TRANSISTOR UN1211/DTC114A (R=10K), UN1213/DTC144A (R=47K)

PNP TRANSISTOR UN1111/DTA114A (R=10K), UN1112/DTA124A (R=22K)

UNLESS OTHERWISE SPECIFIED: DIODES ARE MA165/1SS119 AND WATTAGE OF RESISTORS ARE 1/4W.

NOTE: REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS.
EXAMPLE: C.B.A. ··· R2, REF. NO. 6000 SERIES SCHEMATIC DIAGRAM ··· R6002 (R6002 IS ABBREVIATED TO R2)

VJBS0698

REF.NO. / MODE	IC2001																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	5.0	0	3.0	2.6	2.5	0.1	0.2	0	2.5	5.1	0.3	3.9	0.6	0	2.1	2.1	5.0	0.1	5.0	2.4
REC	5.0	0	3.0	2.4	2.5	2.6	2.6	0	2.7	5.1	0.3	2.0	0.6	0	0	0	5.1	4.9	0	2.1
PLAY	5.0	0	3.0	2.4	2.5	2.6	2.6	0	2.5	5.1	0.3	2.0	0.6	0	0	2.1	2.1	4.9	0	2.0
CUE	5.0	0	3.0	2.4	2.5	2.6	2.6	0	2.5	5.1	0.3	2.0	0.7	0	0	2.1	2.1	2.1	5.0	2.0
REV	5.0	0	3.0	2.3	2.5	2.6	2.7	0	2.5	5.1	0.3	2.0	0.6	0	5.0	2.1	2.1	2.1	4.9	2.1
SLOW(1/4)	4.5	0	3.0	2.6	2.5	2.6	2.6	0	2.5	5.1	0.3	2.0	0.6	0	0	2.1	0	0.1	0	2.1
F.A	4.9	0	3.0	2.6	2.5	2.6	★	0	2.5	5.1	0.3	2.0	0.6	0	0	2.1	0	0.1	0	2.1

REF.NO. / MODE	IC2001							
	21	22	23	24	25	26	27	28
STOP	0	0.1	1.8	2.5	2.6	2.6	0	2.5
REC	3.0	0.3	3.0	3.1	2.6	2.6	0	2.5
PLAY	3.0	0.1	1.8	2.5	2.6	2.5	0	2.5
CUE	3.0	0.3	2.0	2.5	2.6	2.5	0	2.5
REV	3.0	0.3	2.0	2.5	2.6	2.5	0	2.5
SLOW(1/4)	3.0	0.5	1.8	2.5	2.6	2.5	0	2.5
F.A	3.0	0.5	1.9	2.5	2.6	2.6	0	2.5

REF.NO. / MODE	IC2002													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
STOP	3.5	4.6	5.1	5.0	0	0.3	0	1.5	2.2	0.7	0.8	2.6	2.6	4.5
REC	2.5	2.5	5.1	0	5.1	0.3	0	2.6	2.6	2.4	2.6	2.6	2.6	2.5
PLAY	2.5	2.5	5.1	0	5.0	0.3	0	2.6	2.6	2.4	2.6	2.6	2.6	2.5
CUE	2.5	2.5	5.1	4.9	0	0.3	0	2.6	2.6	2.4	2.6	2.6	2.6	2.5
REV	2.5	2.5	5.1	4.9	0	0.3	0	2.6	2.6	2.4	2.6	2.6	2.6	2.5
SLOW(1/4)	2.5	2.5	5.1	0	5.0	0.3	0	1.8	1.8	1.5	1.5	2.6	2.6	2.5
F.A	2.5	2.5	5.1	0	5.0	0.3	0	1.8	2.2	2.0	2.0	2.6	2.6	2.5

REF.NO. / MODE	IC2003															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
STOP	5.1	1.8	0	0	2.6	2.6	2.5	2.5	1.9	1.5	0	2.6	0.7	5.1	★	★
REC	5.1	3.0	2.4	0	2.6	2.6	2.6	2.5	1.9	2.6	2.6	2.6	2.5	5.1	★	★
PLAY	5.1	1.8	0.3	0	2.6	2.6	2.6	2.5	1.9	2.6	2.6	2.6	2.4	5.1	★	★
CUE	5.1	0	0.9	0	2.6	2.6	2.6	2.5	1.9	2.6	2.6	2.6	2.4	5.1	★	★
REV	5.1	1.9	0.5	0	2.6	2.6	2.6	2.5	1.9	2.6	2.6	2.6	2.4	5.1	★	★
SLOW(1/4)	5.1	1.8	0	0	2.6	2.6	2.6	2.5	1.9	2.0	0.2	2.6	1.3	5.1	★	★
F.A	5.1	1.9	0	0	2.6	2.6	2.6	2.5	1.9	2.1	0.3	2.5	1.9	5.1	★	★

REF.NO. / MODE	IC2004																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0.1	5.0	5.0	0.1	2.1	0	4.5	5.1	0	5.0	2.4	0	0	0	0	0	0	0.1	0.2	5.1
REC	0	5.1	0	5.1	0	0	0.1	2.6	2.5	5.0	2.4	2.5	0	0	2.5	0	2.8	0.1	0.2	5.1
PLAY	4.8	2.1	0	5.0	0	0	0.1	2.6	0	5.0	2.4	2.5	0	0	2.5	0	2.8	0.1	0	5.1
CUE	2.7	2.1	4.9	2.1	0	0	2.1	2.2	2.5	5.0	2.4	2.5	0	0	2.5	0.1	2.8	0.3	0.3	5.1
REV	2.6	2.1	4.9	2.1	5.0	5.1	2.1	2.2	2.5	5.0	2.4	2.5	0	0	2.5	0.1	2.8	0.2	0.3	5.1
SLOW(1/4)	3.0	0	0	0	0	2.1	1.9	0.5	2.1	4.6	2.4	2.5	0	0	2.5	0.1	2.8	0.2	0.2	5.1
F.A	3.0	0	0	0	0	2.1	2.3	0.2	2.5	4.9	2.4	2.5	0	0	2.5	0.1	2.8	0.2	0.2	5.1

REF.NO. / MODE	IC2004																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	4.3	4.3	4.8	0.7	1.6	1.6	0	0	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	3.9
REC	2.4	2.4	4.9	2.4	1.6	1.6	0	2.8	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	2.0
PLAY	2.4	2.4	4.9	2.4	1.6	1.6	0	2.7	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	2.0
CUE	2.4	2.4	4.9	2.4	1.6	1.6	0	2.8	2.3	0	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	2.0
REV	2.4	2.4	4.8	2.4	1.6	1.6	0	2.7	2.3	0	2.7	0	5.1	2.5	1.7	0	2.1	0	0	2.0
SLOW(1/4)	2.6	2.0	4.6	1.0	1.6	1.6	0	2.7	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0.1	1.3	2.0
F.A	2.5	2.2	4.8	1.0	1.6	1.6	0	2.7	2.3	3.1	2.7	2.3	5.1	0	1.7	0	2.1	0	0	2.0

REF.NO. / MODE	IC2004	
	41	42
STOP	5.1	0
REC	5.1	0.5
PLAY	5.1	0.5
CUE	5.1	0
REV	5.1	0
SLOW(1/4)	5.1	0.5
F.A	5.1	0.5

REF.NO. / MODE	Q2001			Q2002			Q2003			Q2004			Q2005			Q2006			Q2007		
	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
STOP	0	2.1	0	0.8	0.2	0.8	0	4.6	0	2.6	2.0	2.6	2.6	2.0	2.6	0	0.1	0.6	0	0.6	0
REC	0	0	0	2.4	2.6	2.6	0	0	5.0	2.6	5.0	2.4	2.6	5.0	2.5	0	0.1	0	0	0	0.5
PLAY	0	2.1	0	2.4	2.5	2.4	0	0	5.0	2.6	5.0	2.4	2.6	5.0	2.5	0	0.1	0	0	0	0.5
CUE	0	2.1	0	2.4	2.6	2.6	0	5.0	0	2.6	4.9	2.4	2.6	5.0	2.4	0	0.1	0.6	0	0.6	0
REV	0	2.1	0	2.4	2.6	2.5	0	5.0	0	2.6	5.0	2.4	2.6	5.0	2.4	0	0.1	0.6	0	0.6	0
SLOW(1/4)	0	2.1	0	1.5	1.0	1.5	0	0	5.0	2.6	2.0	2.6	2.6	2.0	2.6	0	0	0	0	0	0.5
F.A	0	2.1	0	★	★	2.0	0	0	5.0	2.6	2.0	2.6	2.6	2.0	2.6	0	0.1	0	0	0	0.5

REF.NO. / MODE	Q2008			Q2009			Q2010		
	E	B	C	E	B	C	E	B	C
STOP	0	0	4.4	0	0.3	5.1	0	0.3	5.1
REC	0	0	2.5	0	0.3	5.1	0.3	0.3	5.1
PLAY	0	0	2.5	0	0.3	5.1	0.3	0.3	5.1
CUE	0	0	2.5	0	0.4	5.1	0	0.3	5.1
REV	0	0	2.5	0	0.3	5.1	0	0.3	5.1
SLOW(1/4)	0	0	2.4	0	0.3	4.9	0.3	0.3	5.1
F.A	0	0	2.5	0	0.3	5.1	0.3	0.3	5.1

REF.NO. / MODE	TP2001	TP2002	TP2003	TP2004	TP2005	TP2006	TP2007
STOP	2.5	1.8	0.1	3.9	2.5	2.6	0
REC	2.5	3.0	4.9	2.0	2.5	2.5	2.6
PLAY	2.5	1.9	4.9	2.0	2.5	2.4	2.6
CUE	2.5	2.0	2.1	2.0	2.5	2.4	2.5
REV	2.5	2.0	2.1	2.0	2.5	2.2	2.6
SLOW(1/4)	2.5	1.9	0.1	2.0	2.5	2.6	0.2
F.A	2.5	1.9	0.1	2.0	2.5	2.6	0.4

VOLTAGE MEASUREMENT:
1. CUE, REVIEW, FRAME ADVANCE, SLOW, COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
   COLOR BAR SIGNAL IN SP MODE.

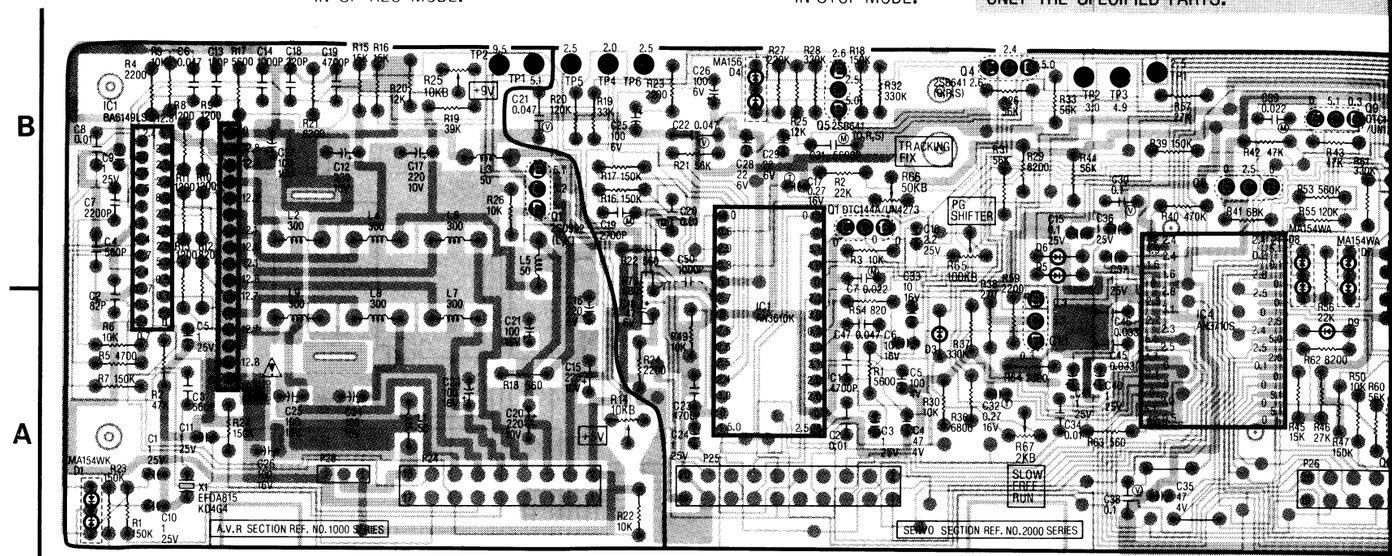
★ : UNMEASURABLE OR UNNECESSARY TO MEASURE.

SERVO/A.V.R. C.B.A. VEPS0245A

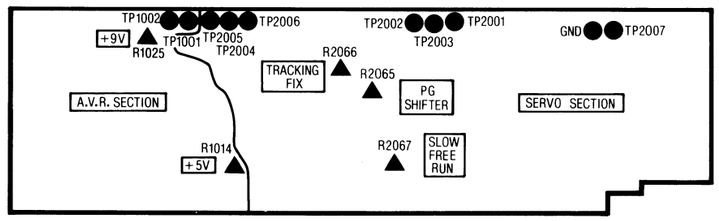
SERVO SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN SP REC MODE.

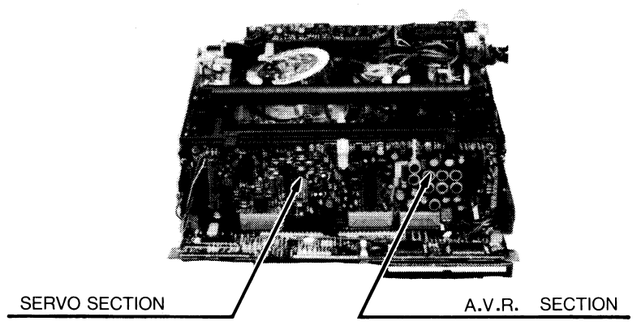
A.V.R. SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN STOP MODE.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAV
SPECIAL CHARACTERISTICS IMPORTANT FOR SA
WHEN REPLACING ANY OF THESE COMPONENTS
ONLY THE SPECIFIED PARTS.



LOCATION OF TEST POINTS & ADJUSTMENT POINTS





SERVO/A.V.R. C.B.A.

P24

1	GND
2	+5V
3	GND
4	+5V
5	GND
6	+9V
7	GND
8	MAIN COIL COMMON
9	SUPPLY REEL Ⓜ FEED BACK
10	CAP Ⓜ POWER
11	TAKEUP REEL Ⓜ FEED BACK
12	SUPPLY REEL Ⓜ POWER
13	CYL Ⓜ FEED BACK
14	TAKEUP REEL Ⓜ POWER
15	CAP Ⓜ FEED BACK
16	CAMERA STAND BY /TIMER SET Ⓗ
17	GND
18	+12V

P25

1	COLOR ROTARY
2	ARTIFICIAL H SYNC
3	CTL PULSE
4	ARTIFICIAL V SYNC
5	SLOW FREE RUN
6	SLOW/F ADV Ⓗ
7	CAP Ⓜ SLOW/STILL/STOP Ⓛ
8	
9	
10	SLP Ⓗ/LP Ⓜ/SP Ⓛ
11	HEAD SW
12	3.58MHz
13	CYL Ⓜ PG/FG
14	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
15	VSS
16	SP/LP/SLP
17	GND
18	SP/LP/SLP SW
19	CTL HEAD
20	GND

P26

1	CAP Ⓜ FG (1)
2	CAP Ⓜ FG (2)
3	GND
4	CYL Ⓜ TORQUE COM
5	CAP Ⓜ TORQUE COM
6	REC Ⓗ
7	CAP Ⓜ FG
8	CYL ON Ⓛ
9	V-LOCK
10	REF V
11	V-LOCK (SLP
12	V-LOCK (SP)
13	CAP Ⓜ REV Ⓗ/STOP
14	CURRENT LIN
15	TAPE SPEED REC Ⓗ/PB Ⓜ
16	ENVELOPE
17	CAP Ⓜ SPEE
18	CAP Ⓜ SPEE
19	HEAD AMP SV
20	CAP Ⓜ REV Ⓗ/STOP

P27

1	SLOW TRACKING
2	TRACKING
3	SLOW TRACKING
4	BRAKE BACKUP

P28

1	+5V
2	+12V
3	GND

	18	19	20
0	0.1	5.0	2.4
1	4.9	0	2.1
1	4.9	0	2.0
1	2.1	5.0	2.0
1	2.1	4.9	2.1
	0.1	0	2.1
	0.1	0	2.1

	18	19	20
	0.1	0.2	5.1
3	0.1	0.2	5.1
3	0.1	0	5.1
3	0.3	0.3	5.1
3	0.2	0.3	5.1
3	0.2	0.2	5.1
3	0.2	0.2	5.1

	38	39	40
	0	0	3.9
	0	0	2.0
	0	0	2.0
	0	0	2.0
	0	0	2.0
	0.1	1.3	2.0
	0	0	2.0

6		Q2007		
	C	E	B	C
	0.6	0	0.6	0
	0	0	0	0.5
	0	0	0	0.5
	0.6	0	0.6	0
	0.6	0	0.6	0
	0	0	0	0.5
	0	0	0	0.5

NCE, SLOW,
P MODE.

MODE.
ECESSARY TO MEASURE.

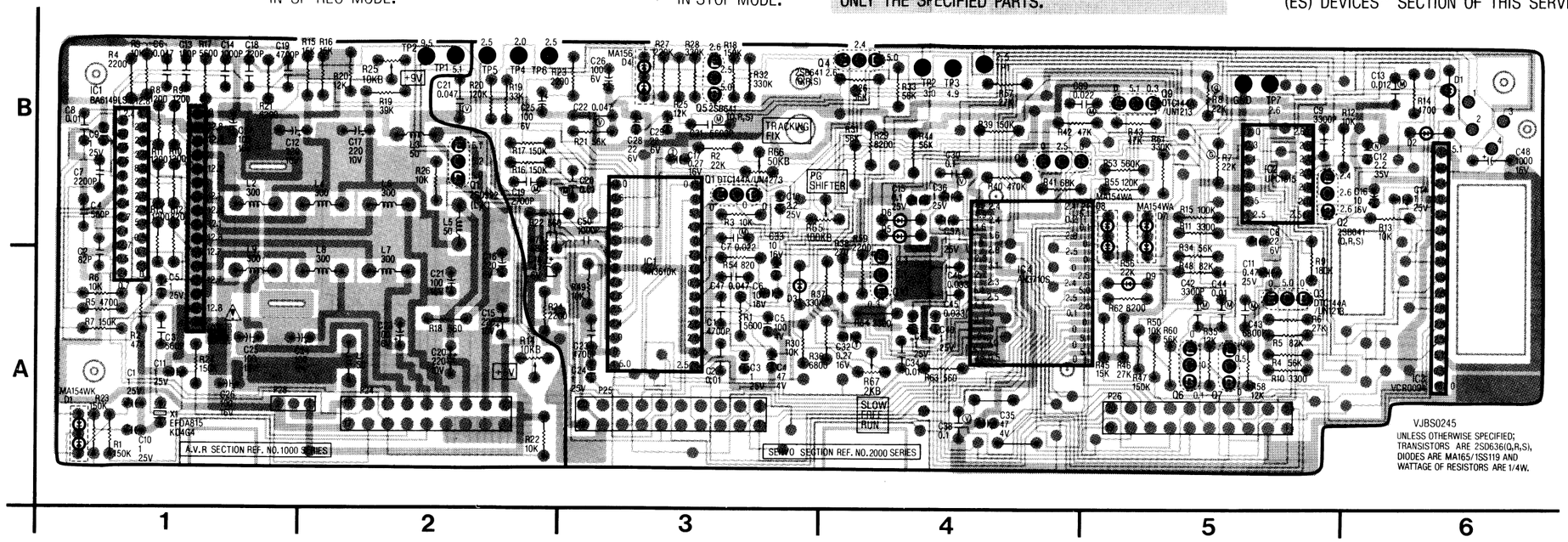
SERVO/A.V.R. C.B.A. VEPS0245A

SERVO SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN SP REC MODE.

A.V.R. SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN STOP MODE.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

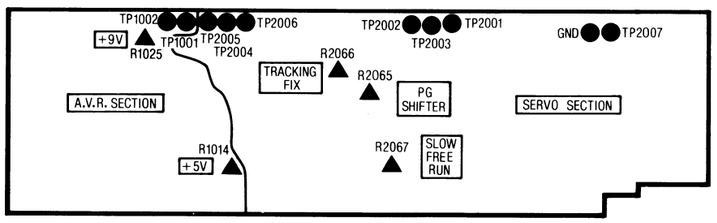
SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

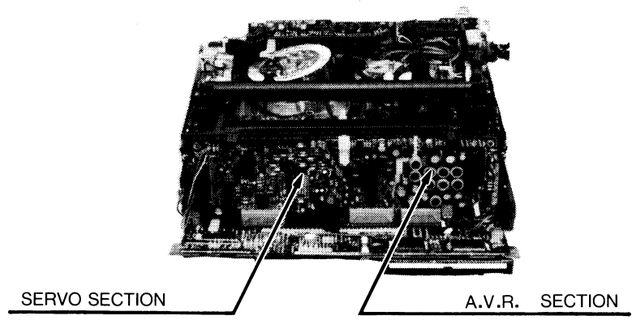


SERVO SECTION	
Q1	3-B
Q2	5-B
Q3	5-A
Q4	4-B
Q5	3-B
Q6	5-A
Q7	5-A
Q8	4-B
Q9	5-B
Q10	4-A

A.V.R. SECTION	
Q1	2-B

LOCATION OF TEST POINTS & ADJUSTMENT POINTS





SERVO/A.V.R. C.B.A.

P24

1	GND
2	+5V
3	GND
4	+5V
5	GND
6	+9V
7	GND
8	MAIN COIL COMMON
9	SUPPLY REEL Ⓜ FEED BACK
10	CAP Ⓜ POWER
11	TAKEUP REEL Ⓜ FEED BACK
12	SUPPLY REEL Ⓜ POWER
13	CYL Ⓜ FEED BACK
14	TAKEUP REEL Ⓜ POWER
15	CAP Ⓜ FEED BACK
16	CAMERA STAND BY /TIMER SET Ⓗ
17	GND
18	+12V

P25

1	COLOR ROTARY
2	ARTIFICIAL H SYNC
3	CTL PULSE
4	ARTIFICIAL V SYNC
5	SLOW FREE RUN
6	SLOW/F ADV Ⓗ
7	CAP Ⓜ SLOW/STILL/STOP Ⓛ
8	
9	
10	SLP Ⓗ/LP Ⓜ/SP Ⓛ
11	HEAD SW
12	3.58MHz
13	CYL Ⓜ PG/FG
14	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
15	VSS
16	SP/LP/SLP
17	GND
18	SP/LP/SLP SW
19	CTL HEAD
20	GND

P26

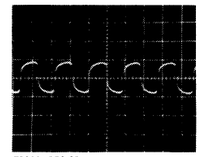
1	CAP Ⓜ FG (1)
2	CAP Ⓜ FG (2)
3	GND
4	CYL Ⓜ TORQUE COMMAND
5	CAP Ⓜ TORQUE COMMAND
6	REC Ⓗ
7	CAP Ⓜ FG
8	CYL ON Ⓛ
9	V-LOCK
10	REF V
11	V-LOCK (SLP)
12	V-LOCK (SP)
13	CAP Ⓜ REV Ⓗ/STOP Ⓜ/FWD Ⓛ
14	CURRENT LIMIT
15	TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
16	ENVELOPE
17	CAP Ⓜ SPEED (1)
18	CAP Ⓜ SPEED (2)
19	HEAD AMP SW
20	CAP Ⓜ REV Ⓗ/STOP Ⓜ/FWD Ⓛ

P27

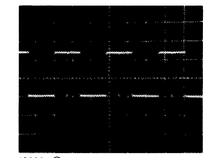
1	SLOW TRACKING
2	TRACKING
3	SLOW TRACKING
4	BRAKE BACKUP

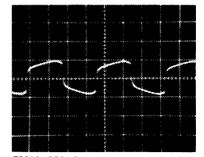
P28

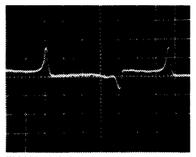
1	+5V
2	+12V
3	GND

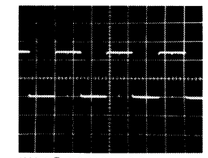

TP2001 REC SP.
0.5V/0.5msec. div.

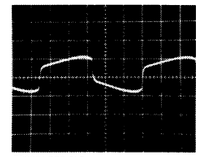
TP2002 PB LP.
1V/5msec. div.

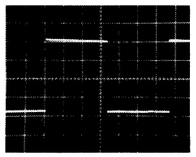

IC2001 ⑤ REC/PB SP.LP.SLP.
2V/50msec. div.

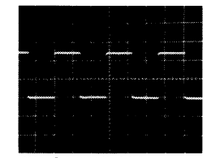

TP2001 REC LP.
0.5V/0.5msec. div.


TP2002 PB SLP.
1V/5msec. div.

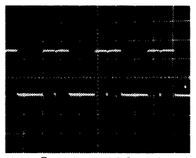

IC2001 ⑥ REC/PB SP.LP.SLP.
2V/50msec. div.


TP2001 REC SLP.
0.5V/0.5msec. div.


TP2004 PB SP.LP.SLP.
1V/5msec. div.


IC2001 ⑦ REC/PB SP.LP.SLP.
2V/50msec. div.

TP2002 PB SP.
1V/5msec. div.

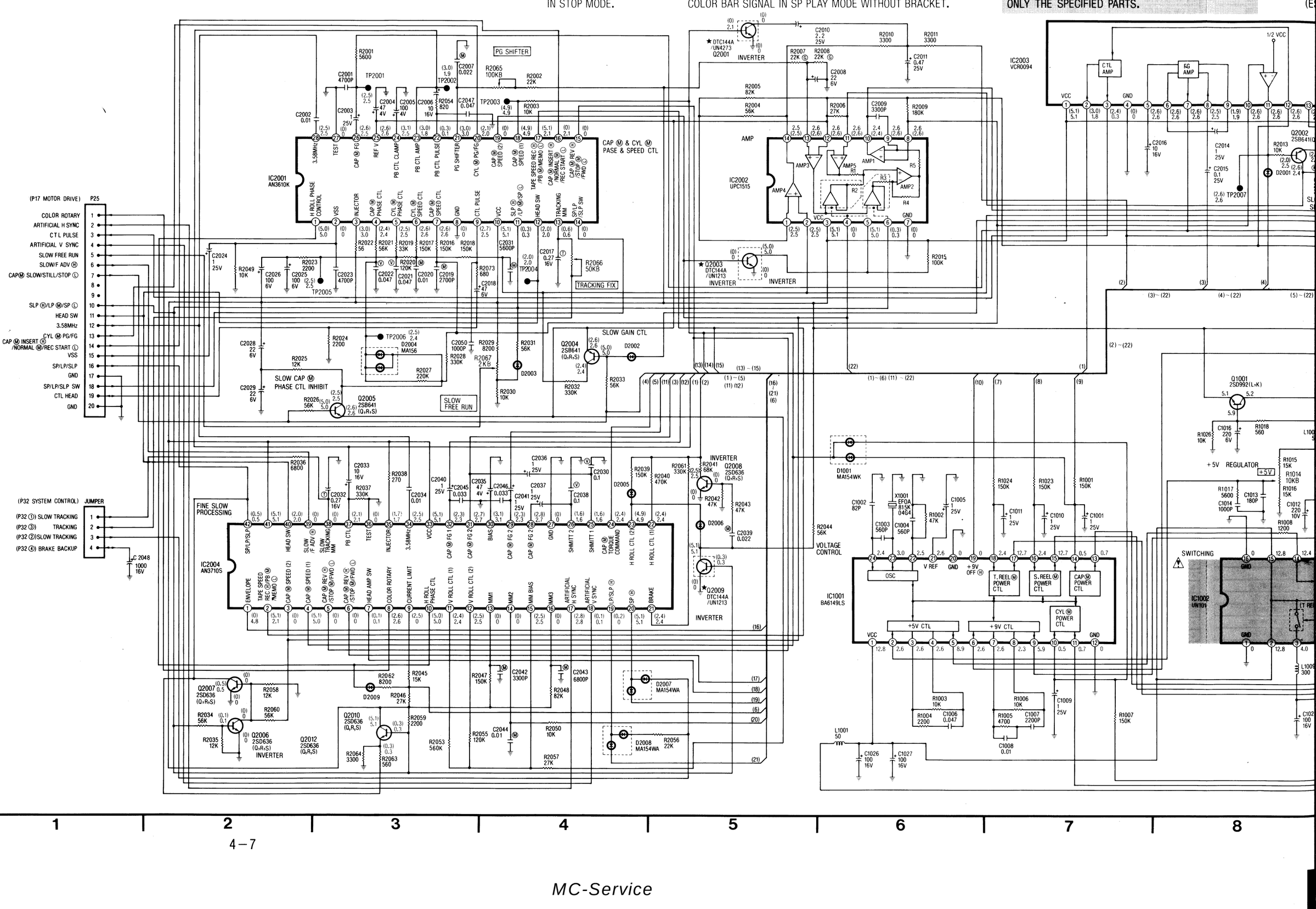

IC2001 ④ REC/PB SP.LP.SLP.
2V/50msec. div.

SERVO/A.V.R. SCHEMATIC DIAGRAM

A.V.R. SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN STOP MODE.

SERVO SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.



V.R. SECTION
OLTAGE MEASUREMENT : COLOR BAR SIGNAL
IN STOP MODE.

SERVO SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

4-7
SERVO/A.V.R.
SCHEMATIC
DIAGRAM

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

SERVO SECTION	
Q2001	5-E
Q2002	8-D
Q2003	5-D
Q2004	4-C
Q2005	3-C
Q2006	2-A
Q2007	2-A
Q2008	5-B
Q2009	5-B
Q2010	3-A

A.V.R. SECTION	
Q1001	8-C

P26 (P16 MOTOR DRIVE)
1 CAP Ⓜ FG (1)
2 CAP Ⓜ FG (2)
3 GND
4 CYL Ⓜ TORQUE COMMAND
5 CAP Ⓜ TORQUE COMMAND
6 REC Ⓗ
7 CAP Ⓜ FG
8 CYL ON Ⓛ
9 V-LOCK
10 REF V
11 V-LOCK (SLP)
12 V-LOCK (SP)
13 CAP Ⓜ REV Ⓗ/STOP Ⓜ/F WD Ⓛ
14 CURRENT LIMIT
15 TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
16 ENVELOPE
17 CAP Ⓜ SPEED (1)
18 CAP Ⓜ SPEED (2)
19 HEAD AMP SW
20 CAP Ⓜ REV Ⓗ/STOP Ⓜ/FWD Ⓛ

P28 (SYSTEM CONTROL)
1 +5V (JUMPER ③)
2 +12V (JUMPER ②)
3 GND (JUMPER ①)

P24 (P18 MOTOR DRIVE)
1 GND
2 +5V
3 GND
4 +5V
5 GND
6 +9V
7 GND
8 MAIN COIL COMMON
9 SUPPLY REEL Ⓜ FEED BACK
10 CAP Ⓜ POWER
11 TAKEUP REEL Ⓜ FEED BACK
12 SUPPLY REEL Ⓜ POWER
13 CYL Ⓜ FEED BACK
14 TAKEUP REEL Ⓜ POWER
15 CAP Ⓜ FEED BACK
16 CAMERA STAND BY /TIMER SET Ⓗ
17 GND
18 +12V

A.V.R. SECTION
NOTE: REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS.
EXAMPLE: C.B.A. ··· R2, REF. NO. 1000 SERIES SCHEMATIC DIAGRAM ··· R1002
(R1002 IS ABBREVIATED TO R2)

SERVO SECTION
NOTE: REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS.
EXAMPLE: C.B.A. ··· R2, REF. NO. 2000 SERIES SCHEMATIC DIAGRAM ··· R2002
(R2002 IS ABBREVIATED TO R2)

★ NOTE:
BELOW ARE EXACT DIAGRAMS OF NPN TRANSISTOR (DTC144A/UN1213) WHICH ARE SHOWN ABRIDGED IN THE ABOVE SCHEMATIC DIAGRAM.

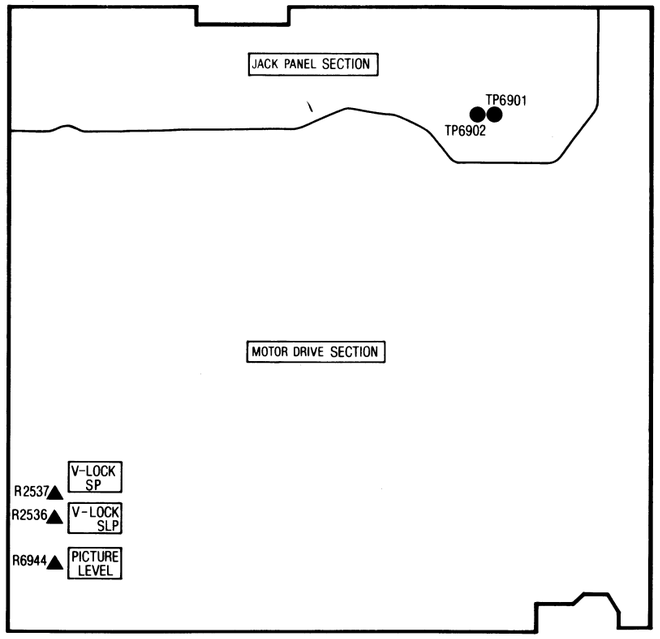
NPN TRANSISTOR (DTC144A/UN1213)

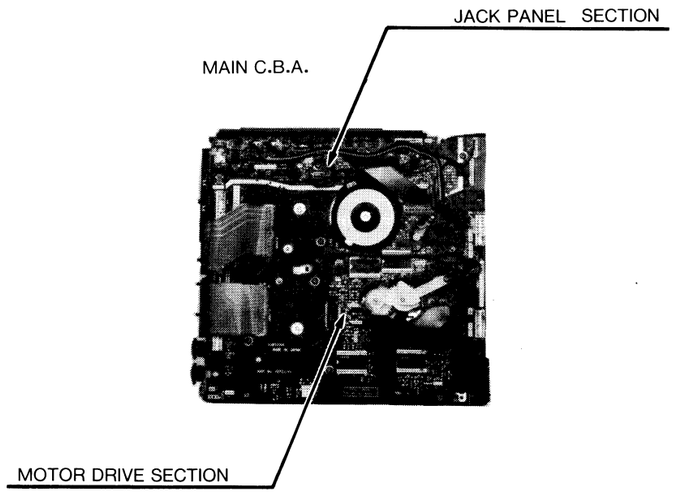
UNLESS OTHERWISE SPECIFIED;
DIODES ARE MA165/1SS119 AND
WATTAGE OF RESISTORS ARE 1/4W.

VJBS0245

4-8
MAIN C.B.A.
(MOTOR DRIVE
/JACK PANEL)

LOCATION OF TEST POINTS & ADJUSTMENT POINTS





P1

1	GND
2	BATTERY

P2

1	BATTERY
2	EXT +12V
3	+12V
4	GND

P3

1	GND
2	AUDIO L CH
3	GND
4	AUDIO R CH
5	SAFETY TAB/CHARGE
6	SERIAL DATA 2
7	SERIAL CLK 2
8	VIDEO
9	ANT/CH LOCK
10	GND

P4

1	AUDIO
2	+12V
3	STAND BY
4	CAMERA PAUSE
5	TALLY
6	SERIAL DATA 1
7	GND
8	GND
9	CAMERA VIDEO
10	GND

P5

1	RF CH
2	+5V
3	VIDEO
4	GND
5	AUDIO
6	GND

P6

1	STOP POSITION
2	MODE POSITION
3	COMMON
4	GND

P7

1	LOADING Ⓜ UNLOAD Ⓗ
2	LOADING Ⓜ LOAD Ⓗ

P8

1	TAKEUP PHOTO TR
2	GND

P9

1	SUPPLY PHOTO TR
2	GND

P10

1	GND
2	DEW SENSOR

P11

1	GND
2	DELAY REC Ⓗ

P12

1	CURRENT EMPHA ON Ⓛ
2	DELAY REC Ⓗ
3	CAP Ⓜ SPEED (1)
4	HEAD SW
5	HEAD AMP SW
6	SP/LP/SLP
7	EXCEPT REC Ⓗ
8	PICTURE CONTROL
9	
10	ENVELOPE
11	ARTIFICIAL V SYNC
12	ARTIFICIAL H SYNC
13	REC Ⓗ
14	EE Ⓗ
15	GND
16	GND

P13

1	COLOR ROTARY
2	+5V
3	VIDEO
4	VSS
5	VIDEO
6	CAMERA VIDEO
7	+9V
8	GND
9	AUDIO REC Ⓗ
10	AUDIO EE Ⓗ
11	AUDIO MUTE Ⓗ
12	DOLBY NR SW
13	AUDIO (R CH)
14	AUDIO (L CH)
15	GND
16	GND
17	AUDIO (L CH)
18	AUDIO (R CH)

P14

1	SENSOR LED
2	TENSION SENSOR
3	GND

P15

1	GND
2	CASSETTE DOWN SW
3	SENSOR LED
4	MAIN BRAKE

P16

1	CAP Ⓜ FG (1)
2	CAP Ⓜ FG (2)
3	GND
4	CYL Ⓜ TORQUE COMMAND
5	CAP Ⓜ TORQUE COMMAND
6	REC Ⓗ
7	CAP Ⓜ FG
8	CYL ON Ⓛ
9	V-LOCK
10	REF V
11	V-LOCK (SLP)
12	V-LOCK (SP)
13	CAP Ⓜ /REV Ⓗ/STOP Ⓜ/FWD Ⓛ
14	CURRENT LIMIT
15	TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
16	ENVELOPE
17	CAP Ⓜ SPEED (1)
18	CAP Ⓜ SPEED (2)
19	HEAD AMP SW
20	CAP Ⓜ REV Ⓗ/STOP Ⓜ/FWD Ⓛ

P17

1	COLOR ROTARY
2	ARTIFICIAL H SYNC
3	CTL PULSE
4	ARTIFICIAL V SYNC
5	SLOW FREE RUN
6	SLOW/F ADV Ⓗ
7	CAP Ⓜ SLOW/STILL/STOP Ⓛ
8	
9	
10	SLP Ⓗ/LP Ⓜ/SP Ⓛ
11	HEAD SW
12	3.58MHz
13	CYL Ⓜ PG/FG
14	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
15	VSS
16	SP/LP/SLP
17	GND
18	SP/LP/SLP SW
19	CTL HEAD
20	GND

P18

1	GND
2	+5V
3	GND
4	+5V
5	GND
6	+9V
7	GND
8	MAIN COIL COMMON
9	SUPPLY REEL Ⓜ FEED BACK
10	CAP Ⓜ POWER
11	TAKEUP REEL Ⓜ FEED BACK
12	SUPPLY REEL Ⓜ POWER
13	CYL Ⓜ FEED BACK
14	TAKEUP REEL Ⓜ POWER
15	CAP Ⓜ FEED BACK
16	CAMERA STAND BY /TIMER SET Ⓗ
17	GND
18	+12V

P19

1	CTL HEAD
2	GND

P33

1	SAFETY TAB Ⓛ
2	GND

P35

1	REEL Ⓜ V FG (+)
2	REEL Ⓜ V FG (−)
3	SUPPLY REEL Ⓜ FG (+)
4	MAIN COIL 1
5	SUPPLY REEL Ⓜ FG(−)
6	H1−
7	H1+
8	MAIN COIL 2
9	VH+
10	H2−
11	H2+
12	MAIN COIL 3
13	H3−
14	VH−
15	H3+

P36

1	MAIN COIL 2
2	H3−
3	H3+
4	MAIN COIL 1
5	MAIN COIL 3
6	H2−
7	VH−
8	H2+
9	VH+
10	H1−
11	H1+
12	REEL Ⓜ V FG (+)
13	TAKEUP REEL Ⓜ FG(+)
14	REEL Ⓜ V FG (−)
15	TAKEUP REEL Ⓜ FG(−)

JUMPER D

1	VH−
2	HES
3	HEM
4	HES
5	HEM
6	VH+
7	MAIN COIL COMMON
8	
9	MAIN COIL 3
10	GND
11	MAIN COIL 1
12	MAIN COIL 2

JUMPER C

1	H2−
2	MAIN COIL 2
3	H2+
4	H3−
5	MAIN COIL 3
6	H3+
7	VH−
8	VH+
9	MAIN COIL 1
10	CAP Ⓜ FG (2)
11	H1−
12	CAP Ⓜ FG (1)
13	H1+
14	+9V
15	GND

JUMPER A

1	LOADING Ⓜ UNLOAD Ⓗ
2	DEW SENSOR
3	CAMERA PAUSE
4	+9V
5	SERIAL DATA (1)
6	CAMERA IN
7	EE Ⓗ
8	SENSOR LED
9	LOADING Ⓜ LOAD Ⓗ
10	VIDEO IN/OUT
11	SERIAL CLK (1)/TALLY Ⓛ
12	MAIN BRAKE
13	CURRENT EMPHA ON Ⓛ
14	VIDEO REC Ⓛ
15	REEL Ⓜ CTL (1)
16	CAMERA STAND BY /TIMER SET Ⓗ
17	SCAN 3
18	+5V
19	DATA IN 4
20	TAKEUP REEL Ⓜ ON Ⓛ
21	FULL ERASE Ⓛ
22	REEL Ⓜ CTL (2)
23	AUDIO REC Ⓛ
24	SUPPLY REEL Ⓜ ON Ⓛ
25	REC Ⓛ
26	DATA IN 3
27	VIDEO EE Ⓗ
28	SUPPLY PHOTO TR Ⓛ
29	AUDIO MUTE Ⓗ
30	

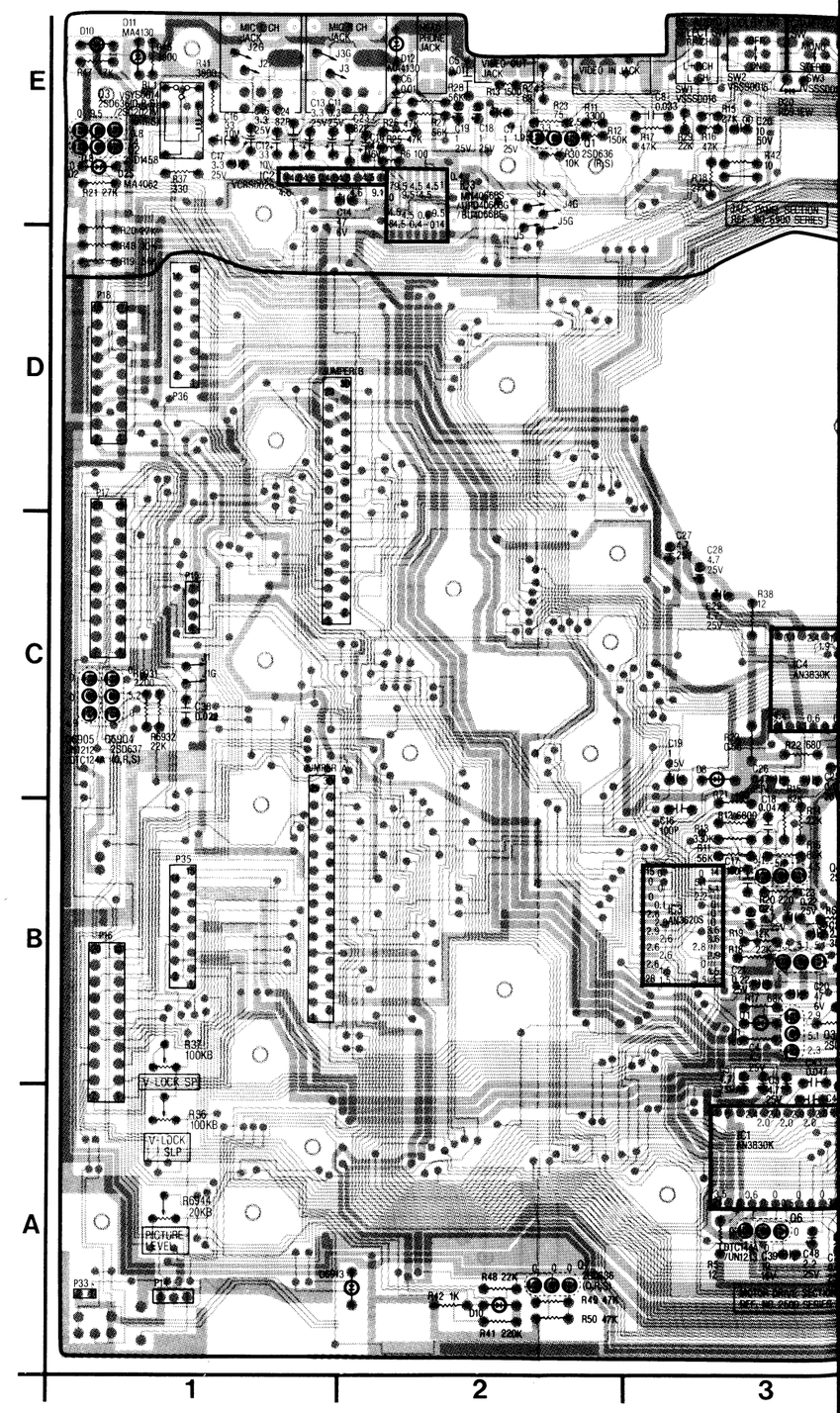
JUMPER B

1	SLP Ⓗ/LP Ⓜ/SLP Ⓛ
2	SP/LP/SLP SW
3	CAP Ⓜ SPEED (2)
4	CAP Ⓜ SPEED (1)
5	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
6	TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
7	HEAD SW
8	CAP Ⓜ SLOW/STILL/STOP Ⓛ
9	CTL PULSE
10	AUDIO EE Ⓗ
11	SERIAL CLK (2)
12	CAP Ⓜ REV Ⓗ /STOP Ⓜ/FWD Ⓛ
13	CYL ON Ⓛ
14	SAFETY TAB ON Ⓛ
15	STAND BY
16	3.58MHz
17	SLOW/F ADV Ⓗ
18	SAFETY TAB/CHARGE
19	SUPPLY REEL PULSE
20	EXT +12V
21	GND
22	GND
23	SERIAL DATA (2)
24	TAKEUP REEL PULSE
25	+12V
26	+12V
27	TAKEUP PHOTO TR
28	BATTERY CHARGE
29	BATTERY CHARGE
30	CASSETTE UP Ⓗ/DOWN Ⓛ

MAIN C.B.A. VEPS0244A (MOTOR DRIVE/J

JACK PANEL SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN STOP MODE.

MOTOR DRIVE SECTION
VOLTAGE MEASUREMENT : COLOR BA
IN SP R



MAIN C.B.A. VEPS0244A (MOTOR DRIVE/JACK PANEL)

JACK PANEL SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN STOP MODE.

MOTOR DRIVE SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL
IN SP REC MODE.

SPECIAL NOTE:
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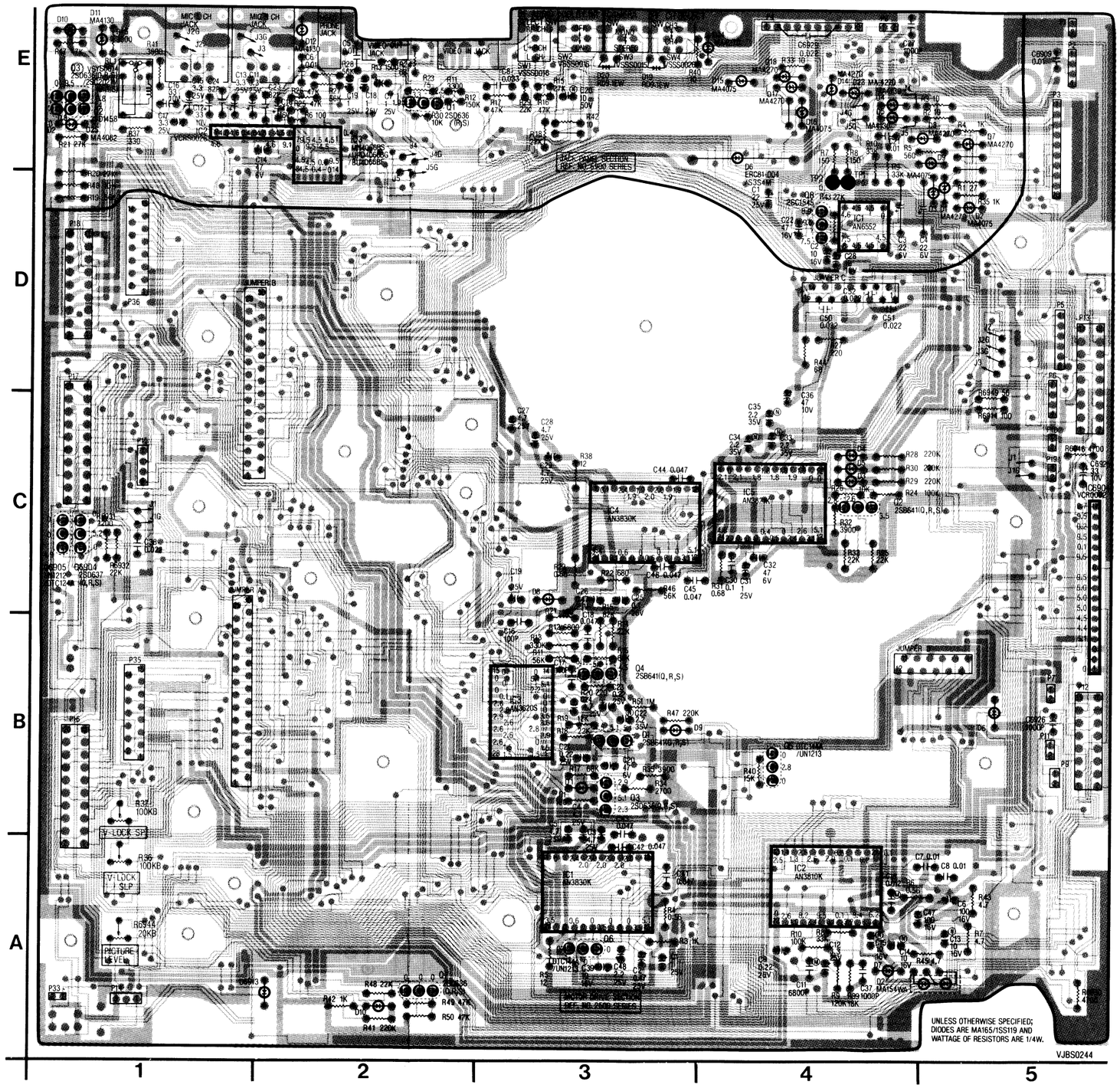


P6

1	STOP POSITION
2	MODE POSITION
3	COMMON
4	GND

P7

1	LOADING Ⓜ UNLOAD Ⓗ
2	LOADING Ⓜ LOAD Ⓗ

P8

1	TAKEUP PHOTO TR
2	GND

P9

1	SUPPLY PHOTO TR
2	GND

P10

1	GND
2	DEW SENSOR

P11

1	GND
2	DELAY REC Ⓗ

P12

1	CURRENT EMPHA ON Ⓛ
2	DELAY REC Ⓗ
3	CAP Ⓜ SPEED (1)
4	HEAD SW
5	HEAD AMP SW
6	SP/LP/SLP
7	EXCEPT REC Ⓗ
8	PICTURE CONTROL
9	
10	ENVELOPE
11	ARTIFICIAL V SYNC
12	ARTIFICIAL H SYNC
13	REC Ⓗ
14	EE Ⓗ
15	GND
16	GND

P13

1	COLOR ROTARY
2	+5V
3	VIDEO
4	VSS
5	VIDEO
6	CAMERA VIDEO
7	+9V
8	GND
9	AUDIO REC Ⓗ
10	AUDIO EE Ⓗ
11	AUDIO MUTE Ⓗ
12	DOLBY NR SW
13	AUDIO (R CH)
14	AUDIO (L CH)
15	GND
16	GND
17	AUDIO (L CH)
18	AUDIO (R CH)

P14

1	SENSOR LED
2	TENSION SENSOR
3	GND

P15

1	GND
2	CASSETTE DOWN SW
3	SENSOR LED
4	MAIN BRAKE

P16

1	CAP Ⓜ FG (1)
2	CAP Ⓜ FG (2)
3	GND
4	CYL Ⓜ TORQUE COMMAND
5	CAP Ⓜ TORQUE COMMAND
6	REC Ⓗ
7	CAP Ⓜ FG
8	CYL ON Ⓛ
9	V-LOCK
10	REF V
11	V-LOCK (SLP)
12	V-LOCK (SP)
13	CAP Ⓜ /REV Ⓗ/STOP Ⓜ/FWD Ⓛ
14	CURRENT LIMIT
15	TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
16	ENVELOPE
17	CAP Ⓜ SPEED (1)
18	CAP Ⓜ SPEED (2)
19	HEAD AMP SW
20	CAP Ⓜ REV Ⓗ/STOP Ⓜ /FWD Ⓛ

P17

1	COLOR ROTARY
2	ARTIFICIAL H SYNC
3	CTL PULSE
4	ARTIFICIAL V SYNC
5	SLOW FREE RUN
6	SLOW/F ADV Ⓗ
7	CAP Ⓜ SLOW/STILL/STOP Ⓛ
8	
9	
10	SLP Ⓗ/LP Ⓜ/SP Ⓛ
11	HEAD SW
12	3.58MHz
13	CYL Ⓜ PG/FG
14	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
15	VSS
16	SP/LP/SLP
17	GND
18	SP/LP/SLP SW
19	CTL HEAD
20	GND

P18

1	GND
2	+5V
3	GND
4	+5V
5	GND
6	+9V
7	GND
8	MAIN COIL COMMON
9	SUPPLY REEL Ⓜ FEED BACK
10	CAP Ⓜ POWER
11	TAKEUP REEL Ⓜ FEED BACK
12	SUPPLY REEL Ⓜ POWER
13	CYL Ⓜ FEED BACK
14	TAKEUP REEL Ⓜ POWER
15	CAP Ⓜ FEED BACK
16	CAMERA STAND BY /TIMER SET Ⓗ
17	GND
18	+12V

P19

1	CTL HEAD
2	GND

P33

1	SAFETY TAB Ⓛ
2	GND

P35

1	REEL Ⓜ V FG (+)
2	REEL Ⓜ V FG (−)
3	SUPPLY REEL Ⓜ FG (+)
4	MAIN COIL 1
5	SUPPLY REEL Ⓜ FG(−)
6	H1−
7	H1+
8	MAIN COIL 2
9	VH+
10	H2−
11	H2+
12	MAIN COIL 3
13	H3−
14	VH−
15	H3+

P36

1	MAIN COIL 2
2	H3−
3	H3+
4	MAIN COIL 1
5	MAIN COIL 3
6	H2−
7	VH−
8	H2+
9	VH+
10	H1−
11	H1+
12	REEL Ⓜ V FG (+)
13	TAKEUP REEL Ⓜ FG(+)
14	REEL Ⓜ V FG (−)
15	TAKEUP REEL Ⓜ FG(−)

JUMPER A

1	LOADING Ⓜ UNLOAD Ⓗ
2	DEW SENSOR
3	CAMERA PAUSE
4	+9V
5	SERIAL DATA (1)
6	CAMERA IN
7	EE Ⓗ
8	SENSOR LED
9	LOADING Ⓜ LOAD Ⓗ
10	VIDEO IN/OUT
11	SERIAL CLK (1)/TALLY Ⓛ
12	MAIN BRAKE
13	CURRENT EMPHA ON Ⓛ
14	VIDEO REC Ⓛ
15	REEL Ⓜ CTL (1)
16	CAMERA STAND BY /TIMER SET Ⓗ
17	SCAN 3
18	+5V
19	DATA IN 4
20	TAKEUP REEL Ⓜ ON Ⓛ
21	FULL ERASE Ⓛ
22	REEL Ⓜ CTL (2)
23	AUDIO REC Ⓛ
24	SUPPLY REEL Ⓜ ON Ⓛ
25	REC Ⓛ
26	DATA IN 3
27	VIDEO EE Ⓗ
28	SUPPLY PHOTO TR Ⓛ
29	AUDIO MUTE Ⓗ
30	

JUMPER B

1	SLP Ⓗ/LP Ⓜ/SP Ⓛ
2	SP/LP/SLP SW
3	CAP Ⓜ SPEED (2)
4	CAP Ⓜ SPEED (1)
5	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
6	TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
7	HEAD SW
8	CAP Ⓜ SLOW/STILL/STOP Ⓛ
9	CTL PULSE
10	AUDIO EE Ⓗ
11	SERIAL CLK (2)
12	CAP Ⓜ REV Ⓗ /STOP Ⓜ/FWD Ⓛ
13	CYL ON Ⓛ
14	SAFETY TAB ON Ⓛ
15	STAND BY
16	3.58MHz
17	SLOW/F ADV Ⓗ
18	SAFETY TAB/CHARGE
19	SUPPLY REEL PULSE
20	EXT +12V
21	GND
22	GND
23	SERIAL DATA (2)
24	TAKEUP REEL PULSE
25	+12V
26	+12V
27	TAKEUP PHOTO TR
28	BATTERY CHARGE
29	BATTERY CHARGE
30	CASSETTE UP Ⓗ/DOWN Ⓛ

JUMPER D

1	VH−
2	$\overline{HES}$
3	$\overline{HEM}$
4	HES
5	HEM
6	VH+
7	MAIN COIL COMMON
8	
9	MAIN COIL 3
10	GND
11	MAIN COIL 1
12	MAIN COIL 2

JUMPER C

1	H2−
2	MAIN COIL 2
3	H2+
4	H3−
5	MAIN COIL 3
6	H3+
7	VH−
8	VH+
9	MAIN COIL 1
10	CAP Ⓜ FG (2)
11	H1−
12	CAP Ⓜ FG (1)
13	H1+
14	+9V
15	GND

MOTOR DRIVE SECTION

Q1	3-B
Q2	4-C
Q3	3-B
Q4	3-B
Q5	4-B
Q6	3-A
Q7	2-A

JACK PANEL SECTION

Q1	2-E
Q2	1-E
Q3	1-E
Q4	1-C
Q5	1-C
Q6	4-D

REF.NO. / MODE	IC2501																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	1.6	0	1.6	2.4	2.0	2.0	2.0	1.9	1.9	2.0	5.1	0	5.1	3.1	5.0	0.2	4.9	0	5.0	0
FF	1.3	0	1.3	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.6	2.6	5.1	3.2	0	0	4.9	0.5	0	0
REC	★	0	★	2.4	2.0	2.0	2.0	2.0	2.0	2.0	★	★	5.1	3.0	0	0	0	0.5	0	0
PLAY	★	0	★	2.4	2.0	2.0	2.0	2.0	2.0	2.0	★	★	5.1	3.1	0	0	0	0.5	0	0
CUE	0.8	0	0.8	2.4	2.0	2.0	2.0	2.0	2.0	2.0	★	★	5.1	3.1	0	0	4.9	0.6	0	0
REV	★	0.3	★	2.5	2.0	2.0	2.0	2.0	2.0	2.0	★	★	5.1	3.2	0.1	0.3	4.9	0.6	0	0
SLOW(1/4)	1.2	0.1	0.5	2.4	2.0	2.0	2.0	2.1	2.1	2.0	5.1	5.1	5.1	3.2	0.3	0.1	0	0.6	0	0
F.A	0.6	0.1	1.9	2.4	2.0	2.0	2.1	2.0	2.0	2.1	5.1	5.1	5.1	3.2	0.1	0.1	0	0.6	0	0

REF.NO. / MODE	IC2501			
	21	22	23	24
STOP	0	0	1.6	3.9
FF	0	0	1.7	3.8
REC	0.6	0	★	3.5
PLAY	0.6	0	★	3.4
CUE	0.6	0	0.9	3.4
REV	0.6	0.3	★	7.1
SLOW(1/4)	0.6	0.1	1.8	3.3
F.A	0.6	0.1	0.6	3.4

REF.NO. / MODE	IC2502																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	12.8	12.8	3.4	3.2	0	0	9.5	0.2	9.2	0.7	2.6	0	4.5	1.1	1.5	2.4	2.8	0	2.4	12.8
FF	12.7	12.7	3.4	3.2	0.1	0	9.5	0.2	9.2	0.7	2.6	0	4.5	1.1	1.5	2.5	2.8	0	2.4	12.7
REC	6.2	6.3	3.4	3.2	0.1	0.1	9.5	2.4	8.2	1.0	2.6	0	2.5	1.4	1.3	2.6	2.6	0	2.0	6.6
PLAY	6.2	6.2	3.4	3.2	0.1	0.1	9.5	2.4	8.3	1.0	2.5	0	2.5	1.4	1.3	2.6	2.6	0	2.0	6.6
CUE	12.0	12.0	3.4	3.2	0.1	0.1	9.5	2.4	8.4	0.9	2.6	0	2.5	1.4	1.3	2.6	2.6	0	2.0	12.4
REV	12.0	12.0	3.4	3.2	0.1	0.1	9.5	2.4	8.4	0.9	2.6	0	2.5	1.4	0	2.6	2.6	0	2.1	12.3
SLOW(1/4)	12.0	12.1	3.4	3.2	0.1	0.1	9.5	2.4	8.4	0.9	2.5	0	2.5	1.4	1.3	2.6	2.6	0	2.1	12.4
F.A	12.1	12.1	3.4	3.3	0.1	0.1	9.5	2.4	8.4	0.9	2.6	0	2.5	1.4	1.3	2.6	2.6	0	2.1	12.4

REF.NO. / MODE	IC2502			
	21	22	23	24
STOP	0	0	12.8	0
FF	0	0	12.7	0
REC	0.1	0	6.2	0.1
PLAY	0.1	0	6.1	0.1
CUE	0.1	0	11.9	0.1
REV	0.1	0	11.9	0.1
SLOW(1/4)	0	0	12.0	0.1
F.A	0.1	0	12.0	0.1

REF.NO. / MODE	IC2503																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	1.5	0	0	0.3	0.3	0	0	0	2.1	5.0	2.2	5.1	5.1	0	0.2	5.0	0.3	0	0	2.6
FF	1.5	1.5	0	1.3	1.3	1.8	1.8	0	0	5.0	2.2	5.1	5.1	0	0	0	0	0	0	2.6
REC	1.5	1.5	0	2.9	2.8	3.6	3.5	0	0	0	2.2	5.1	5.1	0	0	0	0	0	0.1	2.6
PLAY	1.5	1.5	0	2.8	0	3.6	3.5	0	0	0	2.2	5.1	5.1	0	0	0	0	0	0.1	2.6
CUE	1.5	1.4	0	2.8	2.0	3.6	3.5	0	0	0	2.2	5.1	5.1	0	0	0	0.1	0	0.1	2.6
REV	1.5	1.4	0	0	2.9	3.5	3.4	0	0	2.1	2.2	5.1	5.1	0.3	0.3	0	0	0	0	2.6
SLOW(1/4)	1.5	1.4	0	2.8	2.7	3.6	3.6	0	2.1	0	2.1	5.1	5.1	0.1	0.1	0.3	0.1	0	0.1	2.6
F.A	1.5	1.5	0	2.9	2.8	3.6	3.5	0	2.1	0	2.2	5.1	5.1	0.1	0.1	0.1	0.1	0	0	2.6

REF.NO. / MODE	IC2503							
	21	22	23	24	25	26	27	28
STOP	0.1	0	2.6	2.8	2.6	2.6	1.5	1.5
FF	0.1	0	2.6	2.8	2.6	2.6	1.5	1.5
REC	2.9	2.9	2.6	2.6	2.6	2.6	1.5	1.5
PLAY	2.9	2.9	2.6	2.6	2.6	2.6	1.5	1.5
CUE	2.8	2.8	2.6	2.6	2.6	2.6	1.5	1.5
REV	0.1	0	2.7	2.8	2.6	2.6	1.5	1.5
SLOW(1/4)	3.2	3.2	2.6	2.6	2.6	2.6	1.5	1.5
F.A	3.3	3.2	2.6	2.6	2.6	2.6	1.5	1.5

VOLTAGE MEASUREMENT:
1. CUE, REVIEW, FRAME ADVANCE, SLOW, COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
   COLOR BAR SIGNAL IN SP MODE.

★ : UNMEASURABLE OR UNNECESSARY TO MEASURE.

REF.NO. / MODE	IC2504																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	1.6	0	1.6	2.4	1.9	1.9	1.9	2.0	2.0	1.9	0	5.1	5.1	3.0	0	0.3	5.0	0	5.0	0
FF	3.2	0	3.2	2.5	2.0	2.0	2.0	2.0	2.0	2.0	2.6	2.6	5.1	3.1	0	0.1	5.0	0.6	0	0
REC	★	0.1	★	2.4	1.9	1.9	2.0	2.0	1.9	1.9	★	★	5.1	3.1	0	0.1	0	0.6	0	0
PLAY	★	0.1	★	2.4	1.9	1.9	2.0	2.0	1.9	1.9	★	★	5.1	3.1	0	0	0	0.6	0	0
CUE	2.2	0.1	2.0	2.4	2.0	2.0	2.0	2.0	1.9	1.9	2.6	2.6	5.1	3.1	0	0	4.9	0.6	0	0
REV	0.8	0	0.8	2.4	2.0	2.0	2.0	2.0	1.9	1.9	2.6	2.6	5.1	3.1	0.1	0	4.9	0.6	0	0
SLOW(1/4)	★	0.1	★	2.4	1.9	2.0	1.9	2.0	1.9	1.9	★	★	5.1	3.1	0	0	0	0.6	0	0
F.A	★	0.1	0.6	2.4	2.0	2.0	2.0	2.0	1.9	1.9	★	★	5.1	3.1	0	0	0	0.6	0	0

REF.NO. / MODE	IC2504			
	21	22	23	24
STOP	0	0	1.6	4.0
FF	0.6	0	3.4	7.2
REC	0.6	0.1	★	4.4
PLAY	0.6	0.1	★	4.4
CUE	0.6	0.1	2.1	4.7
REV	0.6	0	0.8	3.4
SLOW(1/4)	0.6	0.1	★	4.3
F.A	0.6	0.1	★	4.3

REF.NO. / MODE	IC2505																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	2.6	0	2.6	0	1.8	1.8	1.8	1.9	2.0	1.9	2.1	0	5.1	3.0	2.6	0.7	4.9	0.5	0.4	0
FF	2.6	0	2.6	0	1.9	1.8	1.8	1.9	1.9	1.9	2.1	0	5.1	3.1	2.6	0.7	4.9	0.5	0.4	0
REC	2.1	0	2.1	0	1.8	1.8	1.8	1.8	1.9	1.9	0	0	5.1	3.1	2.6	2.4	0	0.5	0.4	0
PLAY	2.1	0	2.1	0	1.8	1.8	1.8	1.8	1.9	1.9	0	0	5.1	3.1	2.6	2.4	0	0.5	0.4	0
CUE	4.9	0	4.9	0	1.9	1.9	1.9	1.8	2.0	2.0	0	0	5.1	3.1	2.6	2.4	4.9	0.5	0.4	0
REV	4.7	0	4.8	0	1.9	1.9	1.9	1.8	2.0	2.0	5.1	0	5.1	3.1	2.6	2.4	4.9	0.5	0.4	0
SLOW(1/4)	3.0	0	3.0	0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	0	5.1	3.2	2.6	1.3	0	0.5	0.3	0
F.A	★	0	★	0	1.8	1.8	1.8	1.9	2.0	2.0	2.0	0	5.1	3.1	2.6	★	0	0.5	0.4	0

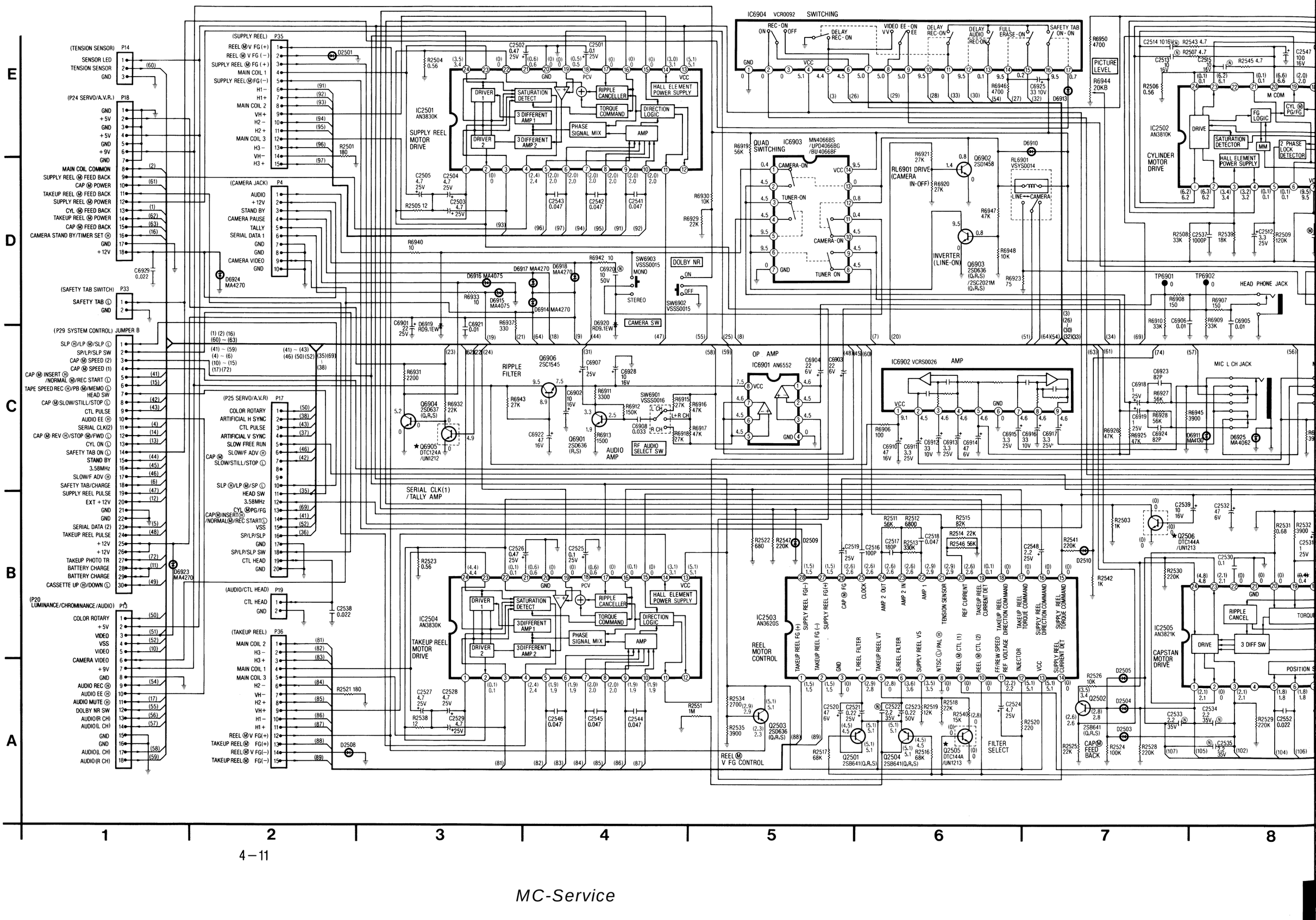
REF.NO. / MODE	IC2505			
	21	22	23	24
STOP	0	0	2.6	12.7
FF	0	0	2.6	12.6
REC	0	0	2.1	4.8
PLAY	0	0	2.1	4.8
CUE	0	0.5	4.9	11.6
REV	0	0.5	4.8	11.7
SLOW(1/4)	0	0.2	2.9	12.5
F.A	0	0.1	★	12.6

REF.NO.	Q2501			Q2502			Q2503			Q2504			Q2505			Q2506			Q2507		
MODE	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
STOP	5.1	4.9	1.9	7.9	7.2	7.9	2.3	3.0	5.1	5.1	4.9	3.8	0	5.5	0.3	0	0	0.2	0	0	2.1
FF	5.1	5.0	4.3	7.9	7.2	7.8	2.3	3.0	5.0	5.1	5.0	4.7	0	5.5	1.3	0	0	0	0	0	0
REC	5.1	4.5	5.1	3.5	2.8	2.6	2.3	2.9	5.1	5.1	4.5	5.1	0	0	2.8	0	0	0	0	0	0
PLAY	5.1	4.5	5.1	3.4	2.8	2.6	2.3	2.9	5.1	5.1	4.5	5.1	0	0	0	0	0	0	0	0	0
CUE	5.1	4.5	5.1	8.4	7.7	5.8	2.3	3.0	5.1	5.1	4.5	5.1	0	0	2.0	0	0	0	0	0	0
REV	5.1	4.5	5.1	8.3	7.7	5.9	2.3	2.9	5.1	5.1	4.5	5.1	0	2.1	2.9	0	0	0.3	0	0	0
SLOW(1/4)	5.1	4.5	5.1	7.8	7.2	7.5	2.3	2.9	5.1	5.1	4.5	5.1	0	0	2.7	0	0	0.1	0	0	2.1
F.A	5.1	4.5	5.1	7.8	7.2	7.7	2.3	3.0	5.1	5.1	4.5	5.1	0	0	2.8	0	0	0.1	0	0	2.1

VOLTAGE MEASUREMENT:
1. CUE, REVIEW, FRAME ADVANCE, SLOW, COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
   COLOR BAR SIGNAL IN SP MODE.

★ : UNMEASURABLE OR UNNECESSARY TO MEASURE.

MAIN SCHEMATIC DIAGRAM (MOTOR DRIVE/JACK PANEL)



SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

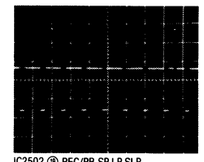
MOTOR DRIVE SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

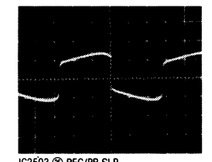
JACK PANEL SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN STOP MODE.

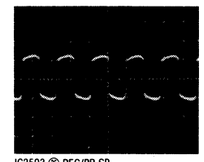
CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

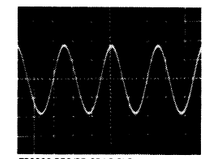
MOTOR DRIVE SECTION	
Q2501	6-A
Q2502	7-A
Q2503	5-A
Q2504	6-A
Q2505	6-A
Q2506	7-B
Q2507	9-A

JACK PANEL SECTION	
Q6901	4-C
Q6902	6-D
Q6903	6-D
Q6904	3-C
Q6905	3-C
Q6906	4-C


IC2502 Ⓡ REC/PB SP.LP.SLP.
1V/5msec. div.


IC2503 Ⓡ REC/PB SLP.
0.5V/0.5msec. div.


IC2503 Ⓧ REC/PB SP.
0.5V/0.5msec. div.


TP6902 REC/PB SP.LP.SLP.
0.2V/0.2msec. div.

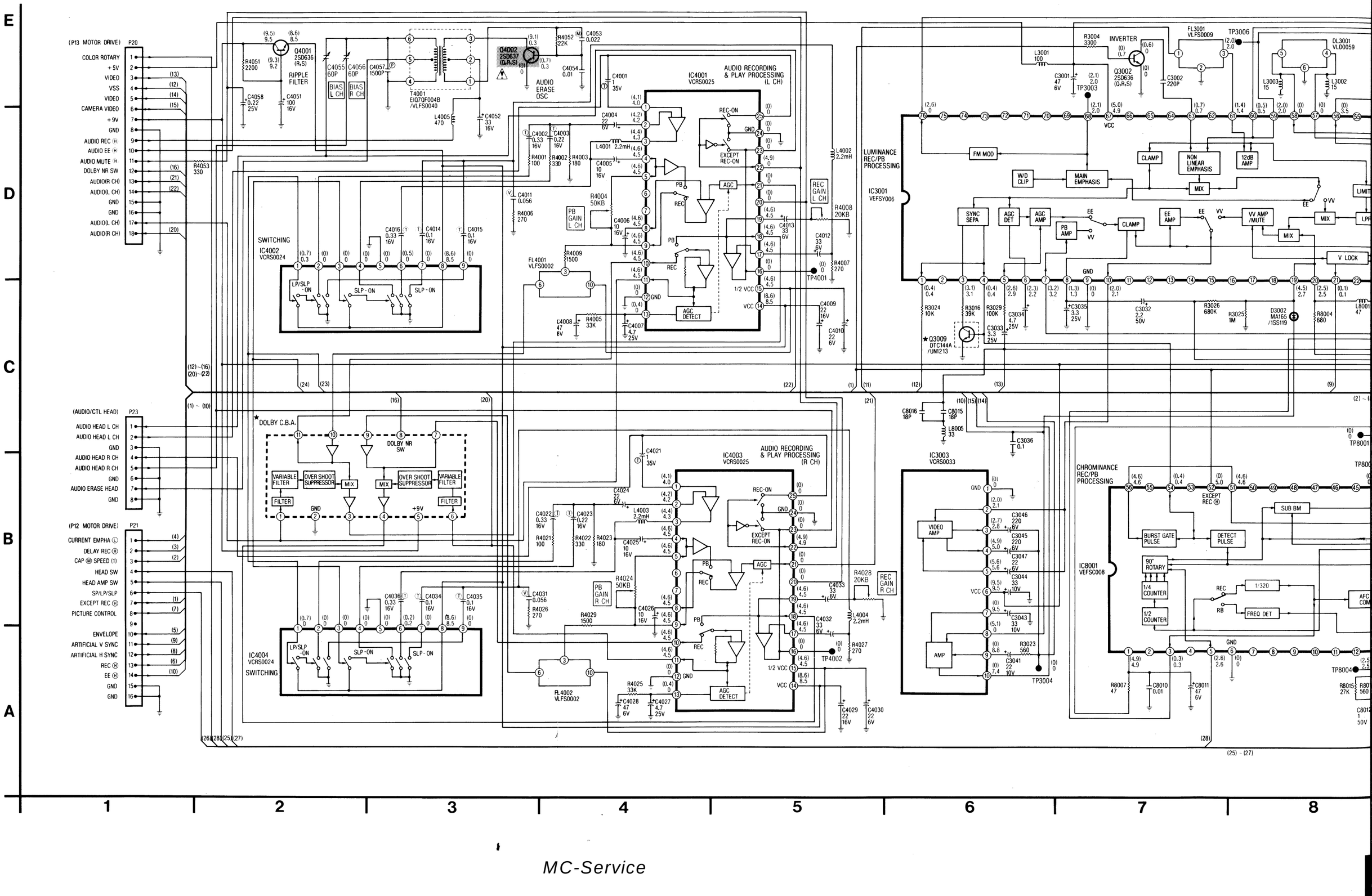
IC2503 Ⓧ REC/PB LP.
0.5V/0.5msec. div.

LUMINANCE/CHROMINANCE/AUDIO SCHEMATIC DIAGRAM

CALLOUTS NEXT TO WIRING PLUGS INDICATE
CONNECTIONS TO OTHER SCHEMATIC DIAGRAM.

AUDIO SECTION
VOLTAGE MEASUREMENT:
MONOSCOPE SIGNAL IN SP REC MODE WITH BRACKET.
MONOSCOPE SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

LUMINANCE/CHROMINANCE SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BR
COLOR BAR SIGNAL IN SP PLAY MODE WITHOU



LUMINANCE/CHROMINANCE SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

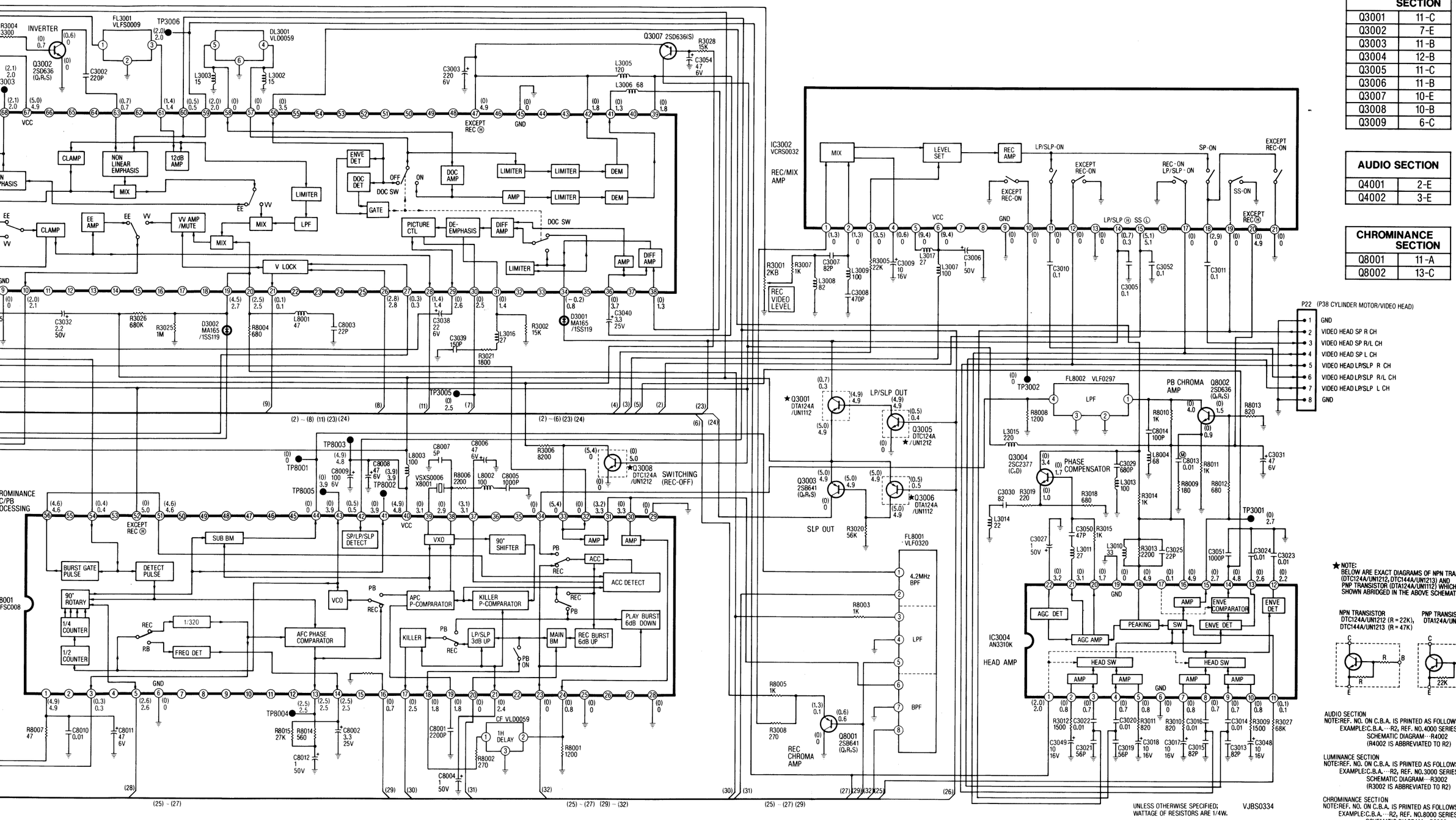
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

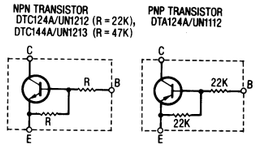
LUMINANCE SECTION	
Q3001	11-C
Q3002	7-E
Q3003	11-B
Q3004	12-B
Q3005	11-C
Q3006	11-B
Q3007	10-E
Q3008	10-B
Q3009	6-C

AUDIO SECTION	
Q4001	2-E
Q4002	3-E

CHROMINANCE SECTION	
Q8001	11-A
Q8002	13-C



★NOTE:
BELOW ARE EXACT DIAGRAMS OF NPN TRANSISTOR (DTC124A/UN1212, DTC144A/UN1213) AND PNP TRANSISTOR (DTA124A/UN1112) WHICH ARE SHOWN ABRIDGED IN THE ABOVE SCHEMATIC DIAGRAM.



AUDIO SECTION
NOTE:REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS.
EXAMPLE:C.B.A.···R2, REF. NO.4000 SERIES
SCHEMATIC DIAGRAM···R4002
(R4002 IS ABBREVIATED TO R2)

LUMINANCE SECTION
NOTE:REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS.
EXAMPLE:C.B.A.···R2, REF. NO.3000 SERIES
SCHEMATIC DIAGRAM···R3002
(R3002 IS ABBREVIATED TO R2)

CHROMINANCE SECTION
NOTE:REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS.
EXAMPLE:C.B.A.···R2, REF. NO.8000 SERIES
SCHEMATIC DIAGRAM···R8002
(R8002 IS ABBREVIATED TO R2)

UNLESS OTHERWISE SPECIFIED; WATTAGE OF RESISTORS ARE 1/4W.

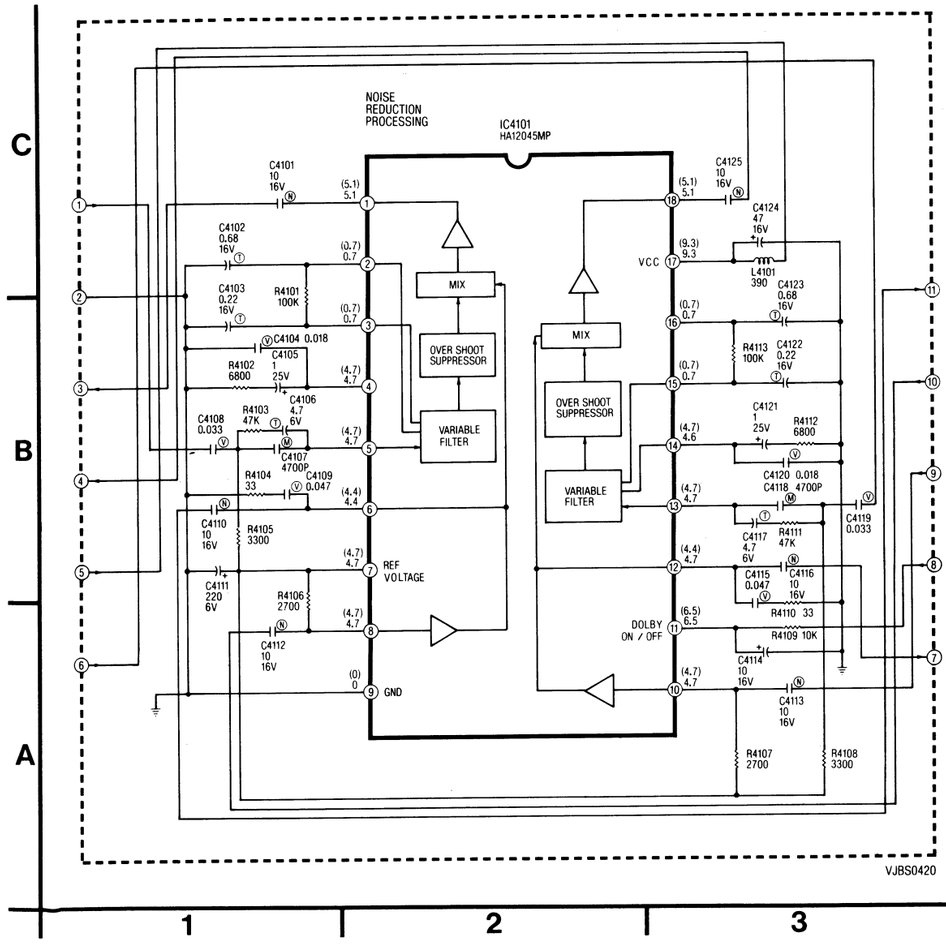
VJBS0334

7 | 8 | 9 | 10 | 11 | 12 | 13 | 14

★ DOLBY SCHEMATIC DIAGRAM

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

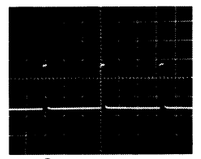
VOLTAGE MEASUREMENT:
MONOSCOPE SIGNAL IN SP REC MODE WITH BRACKET.
MONOSCOPE SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

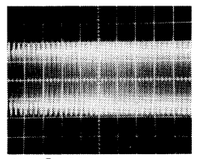


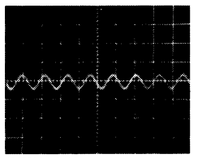
PIN	
1	AUDIO L CH IN (2)
2	GND
3	AUDIO L CH OUT (2)
4	AUDIO R CH OUT (2)
5	+9V
6	AUDIO R CH IN (2)
7	AUDIO R CH OUT (1)
8	DOLBY SW
9	AUDIO R CH IN (1)
10	AUDIO L CH IN (1)
11	AUDIO L CH OUT (1)

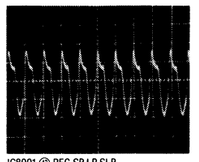
UNLESS OTHERWISE SPECIFIED;
WATTAGE OF RESISTORS ARE 1/4W.

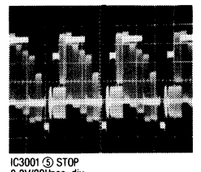
NOTE:REF. NO. ON C.B.A. IS PRINTED AS FOLLOWS.
EXAMPLE:C.B.A. ···R2, REF. NO. 4100 SERIES
SCHEMATIC DIAGRAM ···R4102
(R4102 IS ABBREVIATED TO R2)

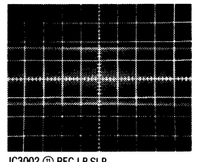

IC3001 ④ REC/PB SP.LP.SLP.
2V/20Usec. div.

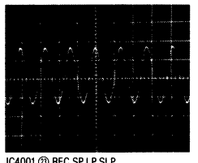

IC3002 ② REC SP.LP.SLP.
50mV/1Usec. div.

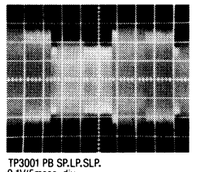

IC4001 ㉑ STOP
20mV/2msec. div.

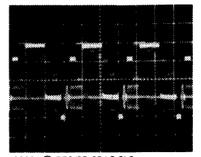

IC8001 ⑭ REC SP.LP.SLP.
0.2V/20Usec. div.

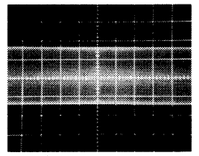

IC3001 ⑤ STOP
0.2V/20Usec. div.

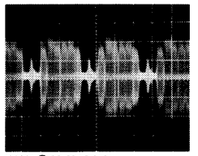

IC3002 ⑪ REC LP.SLP.
1V/1msec. div.

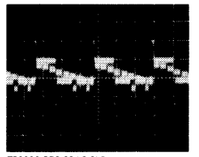

IC4001 ㉒ REC SP.LP.SLP.
0.2V/1msec. div.

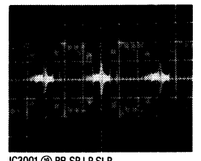

TP3001 PB SP.LP.SLP.
0.1V/5msec. div.

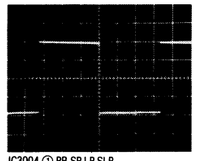

IC3001 ⑯ REC/PB SP.LP.SLP.
0.5V/20Usec. div.

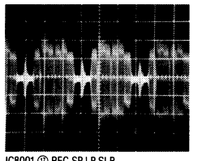

IC3002 ⑨ REC SP.
1V/1msec. div.

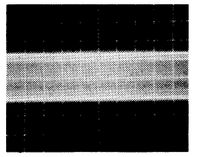

IC8001 ⑰ PB SP.LP.SLP.
0.2V/20Usec. div.

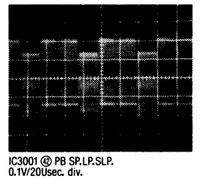

TP3003 REC SP.LP.SLP.
0.2V/20Usec. div.

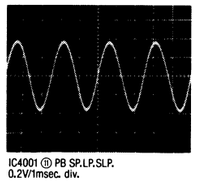

IC3001 ⑱ PB SP.LP.SLP.
0.1V/20Usec. div.


IC3004 ① PB SP.LP.SLP.
1V/5msec. div.

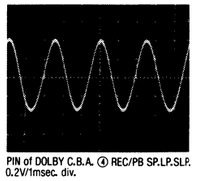

IC8001 ⑪ REC SP.LP.SLP.
0.2V/20Usec. div.

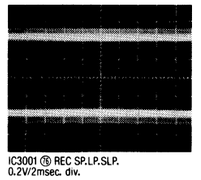

TP8001 STOP
0.2V/20Usec. div.

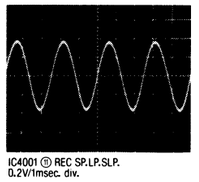

IC3001 ⑫ PB SP.LP.SLP.
0.1V/20Usec. div.

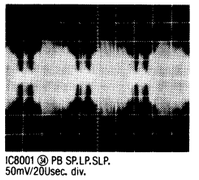

IC4001 ⑪ PB SP.LP.SLP.
0.2V/1msec. div.

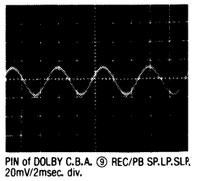
IC8001 ⑱ PB SP.LP.SLP.
0.2V/20Usec. div.


PIN of DOLBY C.B.A. ④ REC/PB SP.LP.SLP.
0.2V/1msec. div.


IC3001 ⑮ REC SP.LP.SLP.
0.2V/2msec. div.


IC4001 ⑮ REC SP.LP.SLP.
0.2V/1msec. div.


IC8001 ㉔ PB SP.LP.SLP.
50mV/20Usec. div.


PIN of DOLBY C.B.A. ⑤ REC/PB SP.LP.SLP.
20mV/2msec. div.

4-14
LUMINANCE
/CHROMINANCE
/AUDIO, DOLBY
VOLTAGE CHART

REF.NO. / MODE	IC3001																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0	2.2	3.1	0.4	2.8	2.2	3.1	1.3	0	2.0	0.6	0.1	0	0	0	0	0	0	4.5	0
REC	0.4	2.2	3.1	0.4	2.6	2.3	3.2	1.3	0	2.0	0.5	0.1	0	0	0	0	0	0	4.5	2.5
PLAY	0.4	2.2	3.1	0.4	2.9	2.2	3.2	1.3	0	2.1	2.5	3.2	0	0	0	0	0	0	2.7	2.5
CUE	0	2.1	2.9	0.7	2.6	1.9	2.7	1.2	0	2.0	2.2	2.9	0	0	0	0	0	0	2.4	2.3
REV	0	2.2	3.1	0.4	2.8	2.2	3.1	1.3	0	2.1	2.5	3.2	0	0	0	0	0	0	2.6	2.5

REF.NO. / MODE	IC3001																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	0.1	★	★	★	★	2.8	0.3	1.4	2.6	2.5	1.4	2.5	0	0.8	0	3.7	0	1.3	1.8	0
REC	0.1	★	★	★	★	2.8	0.3	1.4	0	0	0	0	0	−0.2	0	0	0	0	0	0
PLAY	0.1	★	★	★	★	2.8	0.3	1.4	2.6	2.5	1.4	2.5	0	0.8	0	3.7	0	1.3	1.8	0
CUE	0.2	★	★	★	★	2.4	0.5	1.3	2.4	2.3	1.3	2.3	0	0.7	0	3.4	0	1.1	1.5	0
REV	0.2	★	★	★	★	2.8	0.3	1.4	2.6	2.5	1.4	2.5	0	0.8	0	3.7	0	1.3	1.8	0

REF.NO. / MODE	IC3001																			
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	1.3	1.8	1.9	0	0	0	4.9	3.5	0	4.8	0	★	★	★	★	3.5	0	0	0	0
REC	0	0	0	0	0	0	0	0	0	0	0	★	★	★	★	0	0	0	2.0	0.5
PLAY	1.3	1.8	1.9	0	0	0	4.9	3.5	0	4.9	0	★	★	★	★	3.5	0	0	2.0	0.5
CUE	1.1	1.6	1.7	0	0	0	4.6	3.2	0	4.5	0	★	★	★	★	3.2	0	0	1.9	0
REV	1.3	1.8	1.9	0	0	0	4.9	3.5	0	4.8	0	★	★	★	★	3.5	0	0	2.0	0

REF.NO. / MODE	IC3001															
	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
STOP	1.4	3.9	0.7	0	0	0	4.9	2.1	2.1	0	1.9	2.2	2.6	2.4	0	2.6
REC	1.4	3.9	0.7	0	0	0	5.0	2.1	2.1	0	1.9	2.2	2.6	2.4	0	2.6
PLAY	1.4	4.0	0.7	0	0	0	4.9	2.0	2.0	0	1.9	2.2	2.6	2.4	0	0
CUE	1.1	3.6	0.5	0	0	0	4.7	1.9	1.8	0	1.6	1.8	2.2	1.9	0	2.6
REV	1.4	4.0	0.7	0	0	0	4.9	2.0	2.0	0	1.9	2.2	2.6	2.3	0	3.0

REF.NO. / MODE	IC3002																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0	0	3.4	0	0	0	★	★	0	0	0	0	0	0.3	0	★	0	0	0	4.9
REC	1.3	1.3	3.5	0.6	9.4	9.4	★	★	0	0	0	0	0	0.7	5.1	★	0	2.9	0	0
PLAY	0	0	0	0	0	0	★	★	0	0	0	0	0	0.3	5.1	★	0	0	0	4.9
CUE	0.3	0	0	0	0	0	★	★	0	0	0	0	0	0.2	1.9	★	0	0	0	4.5
REV	0	0	0	0	0	0	★	★	0	0	0	0	0	0.3	2.1	★	0	2.9	0	4.9

REF.NO. / MODE	IC3002	IC3003																		
	21	1	2	3	4	5	6	7	8	9	10									
STOP	0	0	2.0	2.7	5.0	5.6	9.5	0	5.1	0	0									
REC	0	0	2.0	2.7	4.9	5.6	9.5	0	5.1	0	0									
PLAY	0	0	2.1	2.8	5.0	5.6	9.5	9.5	0	8.8	7.4									
CUE	0	0	2.1	2.7	4.9	5.6	9.5	9.5	0	8.8	7.4									
REV	0	0	2.1	2.8	4.9	5.7	9.5	9.5	0	8.8	7.4									

REF.NO. / MODE	IC3004																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	3.9	0.8	0.7	0.7	0.8	0	0.8	0.6	0.6	0.8	2.7	2.2	2.2	4.8	2.7	4.9	0.1	4.9	0	1.7
REC	2.0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
PLAY	2.0	0.8	0.7	0.7	0.8	0	0.8	0.7	0.7	0.8	0.1	2.2	2.6	4.8	2.7	4.9	0.1	4.9	0	1.7
CUE	2.0	0.8	0.7	0.7	0.8	0	0.8	0.7	0.7	0.8	1.2	2.3	2.3	2.7	2.7	4.9	0.1	4.9	0	1.7
REV	2.0	0.8	0.7	0.7	0.8	0	0.8	0.7	0.7	0.8	1.2	2.3	2.3	2.6	2.7	4.9	0.1	4.9	0	1.7

REF.NO. / MODE	IC3004																			
	21	22																		
STOP	3.1	2.7																		
REC	0	0																		
PLAY	3.1	3.2																		
CUE	3.1	3.2																		
REV	3.1	3.2																		

REF.NO. / MODE	IC4001																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	4.1	4.2	4.4	4.6	4.6	★	★	4.6	4.6	4.6	4.6	0	0.4	8.6	4.6	0	4.6	4.6	4.6	0
REC	4.1	4.2	4.4	4.6	4.6	★	★	4.6	4.6	4.6	4.6	0	0.4	8.6	4.6	0	4.6	4.6	4.6	0
PLAY	4.0	4.2	4.3	4.5	4.5	★	★	4.5	4.5	4.5	4.5	0	0	8.5	4.5	0	4.5	4.5	4.5	0

REF.NO. / MODE	IC4001					IC4002														
	21	22	23	24	25	1	2	3	4	5	6	7	8	9						
STOP	0	4.9	0	0	0	0.3	0	0	0	0	0	0	8.6	0						
REC	0	4.9	0	0	0	0.7	0	0	0	0	0.5	0	8.6	0						
PLAY	0	0	0	0	0	0.3	0	0	0	0	0	0	8.5	0						

REF.NO. / MODE	IC4003																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	4.1	4.2	4.4	4.6	4.6	★	★	4.6	4.6	4.6	4.6	0	0.4	8.6	4.6	0	4.6	4.6	4.6	0
REC	4.1	4.2	4.4	4.6	4.6	★	★	4.6	4.6	4.6	4.6	0	0.4	8.6	4.6	0	4.6	4.6	4.6	0
PLAY	4.0	4.2	4.3	4.5	4.5	★	★	4.5	4.5	4.5	4.5	0	0	8.5	4.5	0	4.5	4.5	4.5	0

REF.NO. / MODE	IC4003					IC4004														
	21	22	23	24	25	1	2	3	4	5	6	7	8	9						
STOP	0	4.8	0	0	0	0.3	0	0	0	0	0.2	0	8.6	0						
REC	0	4.9	0	0	0	0.7	0	0	0	0	0.2	0	8.6	0						
PLAY	0	4.9	0	0	0	0	0	0	0	0	0.2	0	8.5	0						

REF.NO. / MODE	IC4101																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
STOP	5.1	0.7	0.7	4.7	4.7	4.4	4.7	4.7	0	4.7	6.5	4.4	4.7	4.6	0.7	0.7	9.3	5.1		
REC	5.1	0.7	0.7	4.7	4.7	4.4	4.7	4.7	0	4.7	6.5	4.4	4.7	4.7	0.7	0.7	9.3	5.1		
PLAY	5.1	0.7	0.7	4.7	4.7	4.4	4.7	4.7	0	4.7	6.5	4.4	4.7	4.6	0.7	0.7	9.3	5.1		

REF.NO. / MODE	IC8001																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	4.9	0	0.3	0	0.1	0	★	★	★	★	★	★	2.5	2.5	1.0	0	0	1.8	1.8	0
REC	4.9	0	0.3	0	2.6	0	★	★	★	★	★	★	2.5	2.5	1.0	0	0	0	0	0
PLAY	4.9	0	0.3	0	2.6	0	★	★	★	★	★	★	2.5	2.5	1.0	0.7	2.5	1.8	1.8	0
CUE	4.9	0	0.3	0	2.2	0	★	★	★	★	★	★	2.5	2.5	1.0	0.6	2.5	1.8	1.8	0
REV	4.9	0	0.3	0	2.2	0	★	★	★	★	★	★	2.4	2.5	1.0	0.6	2.5	1.8	1.8	0

REF.NO. / MODE	IC8001																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	2.9	3.3	0	0.9	0	0	0	0	0	3.3	3.3	0	0	0	0	0	3.1	2.9	3.1	4.8
REC	0	0	0	0	0	0	0	0	0	0	3.2	0	5.4	0	0	0	3.1	0	0	4.9
PLAY	2.4	3.4	0	0.8	0	0	0	0	0	3.3	3.3	0	0	0	0	0	3.1	2.9	3.1	4.8
CUE	2.5	3.4	0	0.9	0	0	0	0	0	3.2	3.3	0	0	0	0	0	3.0	2.9	3.1	4.8
REV	2.5	3.4	0	0.8	0	0	0	0	0	3.3	3.3	0	0	0	0	0	3.0	2.8	3.1	4.9

REF.NO. / MODE	IC8001																			
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56				
STOP	3.9	0	3.9	0	★	★	★	★	★	★	4.6	5.0	0	0.4	0	4.6				
REC	0	0.5	0	0	★	★	★	★	★	★	4.6	0	0.3	0.4	0	4.6				
PLAY	3.9	0.5	3.9	0	★	★	★	★	★	★	4.6	5.0	0.3	0.4	0	4.6				
CUE	3.9	0	3.9	0	★	★	★	★	★	★	4.6	5.0	1.6	0.4	0	4.6				
REV	3.9	0	3.9	0	★	★	★	★	★	★	4.6	5.0	2.1	0.4	0	4.6				

REF.NO. / MODE	Q3001			Q3002			Q3003			Q3004			Q3005			Q3006				
	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C		
STOP	4.9	4.9	0.3	0	0.7	0	4.9	4.9	0	0.4	1.1	2.6	0	0	4.9	4.9	0	4.9		
REC	5.0	4.9	0.7	0	0	0.6	5.0	5.0	0	0	0	0	0	0.5	4.9	5.0	0.5	5.0		
PLAY	4.9	4.9	0.3	0	0.7	0	4.9	4.9	0	1.0	1.7	3.4	0	0.4	4.9	4.9	0.5	4.9		
CUE	4.9	4.9	0.3	0	0.7	0	4.9	4.9	0	1.0	1.7	3.5	0	0	4.9	4.9	0	4.9		
REV	4.9	4.9	0.3	0	0.7	0	4.9	4.9	0	1.0	1.7	3.5	0	0	4.9	4.9	0	4.9		

REF.NO. / MODE	Q3007			Q3008			Q3009													
	E	B	C	E	B	C	E	B	C											
STOP	4.9	4.9	4.9	0	5.0	0	0	0.4	2.5											
REC	0	0	0	0	0	5.4	0	0.4	2.0											
PLAY	4.9	5.1	4.9	0	5.0	0	0	0.4	2.0											
CUE	4.6	5.0	4.5	0	5.0	0	0	0.7	2.0											
REV	4.9	5.2	4.9	0	5.0	0	0	0.4	2.0											

REF.NO. / MODE	Q8001			Q8002																
	E	B	C	E	B	C														
STOP	0.1	0	0	0.8	1.5	4.0														
REC	1.3	0.6	0	0	0	0														
PLAY	0.1	0.6	0	0.9	1.5	4.0														
CUE	0.3	0.6	0	0.9	1.5	4.0														
REV	0.3	0.6	0	0.9	1.5	4.0														

REF.NO. / MODE	Q4001			Q4002																
	E	B	C	E	B	C														
STOP	8.6	9.3	9.5	0	0.3	0.3														
REC	8.6	9.3	9.5	0	0.7	9.1														
PLAY	8.5	9.2	9.5	0	0.3	0.3														

REF.NO. / MODE	TP3001	TP3002	TP3003	TP3004	TP3005	TP3006														
STOP	2.7	0	2.0	0	2.5	0														
REC	0	0	2.1	0	0	2.0														
PLAY	2.7	0	2.0	0	2.5	2.0														
CUE	2.7	0	2.0	0	2.3	1.9														
REV	2.7	0	2.0	0	2.5	2.0														

REF.NO. / MODE	TP4001	TP4002																		
STOP	0	0																		
REC	0	0																		
PLAY	0	0																		

REF.NO. / MODE	TP8001	TP8002	TP8003	TP8004	TP8005															
STOP	0	3.9	4.9	2.5	3.9															
REC	0	3.9	4.9	2.5	0															
PLAY	0	3.9	4.8	2.5	3.9															
CUE	0	3.9	4.9	2.5	3.9															
REV	0	3.2	4.8	2.5	3.1															

VOLTAGE MEASUREMENT:
1. CUE, REVIEW,
   COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
   COLOR BAR SIGNAL IN SP MODE.

★ : UNMEASURABLE OR UNNECESSARY TO MEASURE.

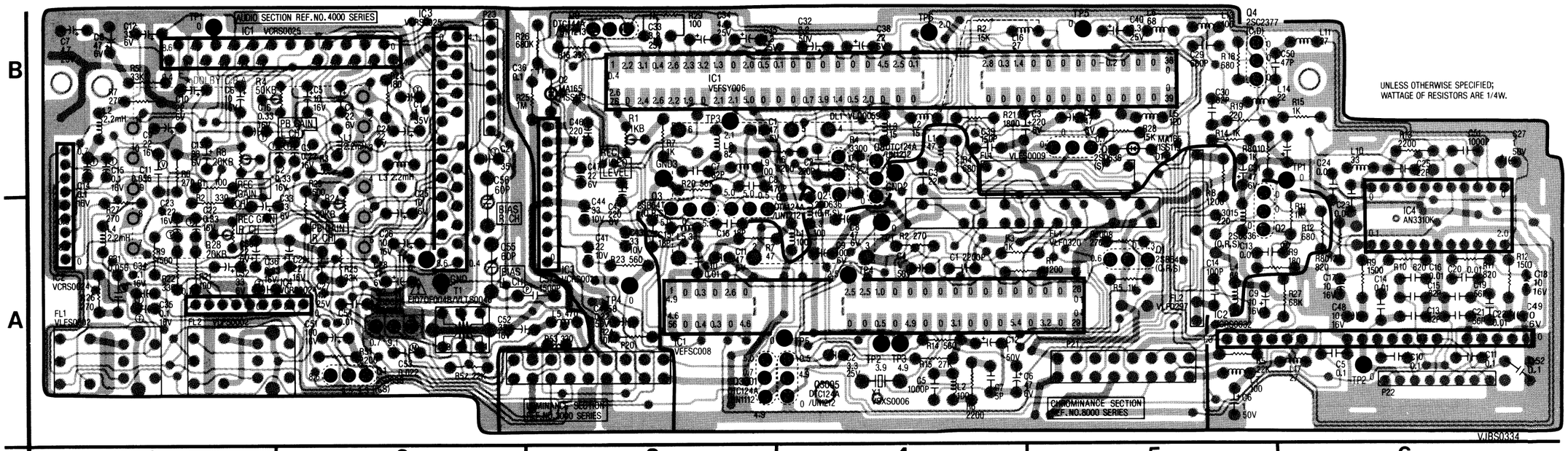
LUMINANCE/CHROMINANCE/AUDIO C.B.A. VEPS0334A

AUDIO SECTION
VOLTAGE MEASUREMENT : MONO SCOPE SIGNAL
IN SP REC MODE.

LUMINANCE/CHROMINANCE SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL
IN SP REC MODE.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

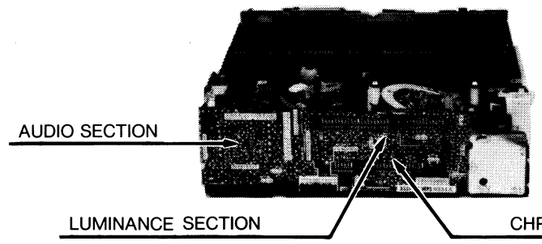
SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.



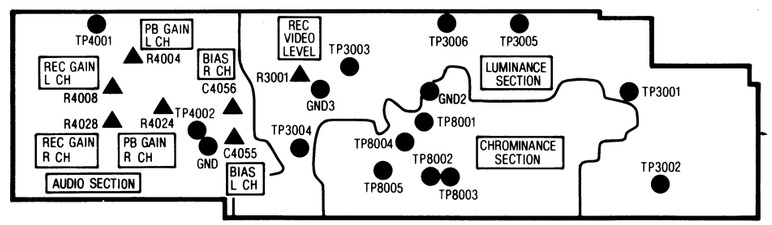
AUDIO SECTION	
Q1	2-A
Q2	2-A

CHROMINANCE SECTION	
Q1	5-A
Q2	5-A

LUMINANCE SECTION	
Q1	3-A
Q2	4-B
Q3	3-A
Q4	5-B
Q5	4-A
Q6	3-A
Q7	5-B
Q8	4-B
Q9	3-B



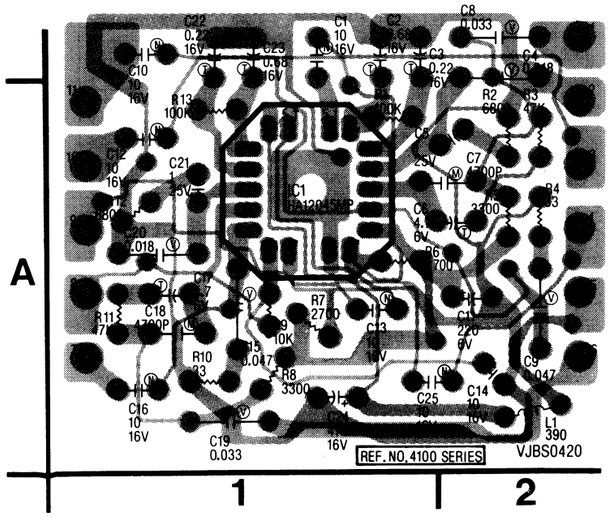
LOCATION OF TEST POINTS & ADJUSTMENT POINTS



4-15
RF CONVERTER
CIRCUIT
(VEPS0256,
EN16801)

★ DOLBY C.B.A. VEPS0420A

VOLTAGE MEASUREMENT : COLOR BAR SIGNAL
IN SP REC MODE.



P20	
1	COLOR ROTARY
2	+5V
3	VIDEO
4	VSS
5	VIDEO
6	CAMERA VIDEO
7	+9V
8	GND
9	AUDIO REC Ⓗ
10	AUDIO EE Ⓗ
11	AUDIO MUTE Ⓗ
12	DOLBY NR SW
13	AUDIO (R CH)
14	AUDIO (L CH)
15	GND
16	GND
17	AUDIO (L CH)
18	AUDIO (R CH)

P21	
1	CURRENT EMPHA Ⓛ
2	DELAY REC Ⓗ
3	CAP Ⓜ SPEED (1)
4	HEAD SW
5	HEAD AMP SW
6	SP/LP/SLP
7	EXCEPT REC Ⓗ
8	PICTURE CONTROL
9	
10	ENVELOPE
11	ARTIFICIAL V SYNC
12	ARTIFICIAL H SYNC
13	REC Ⓗ
14	EE Ⓗ
15	GND
16	GND

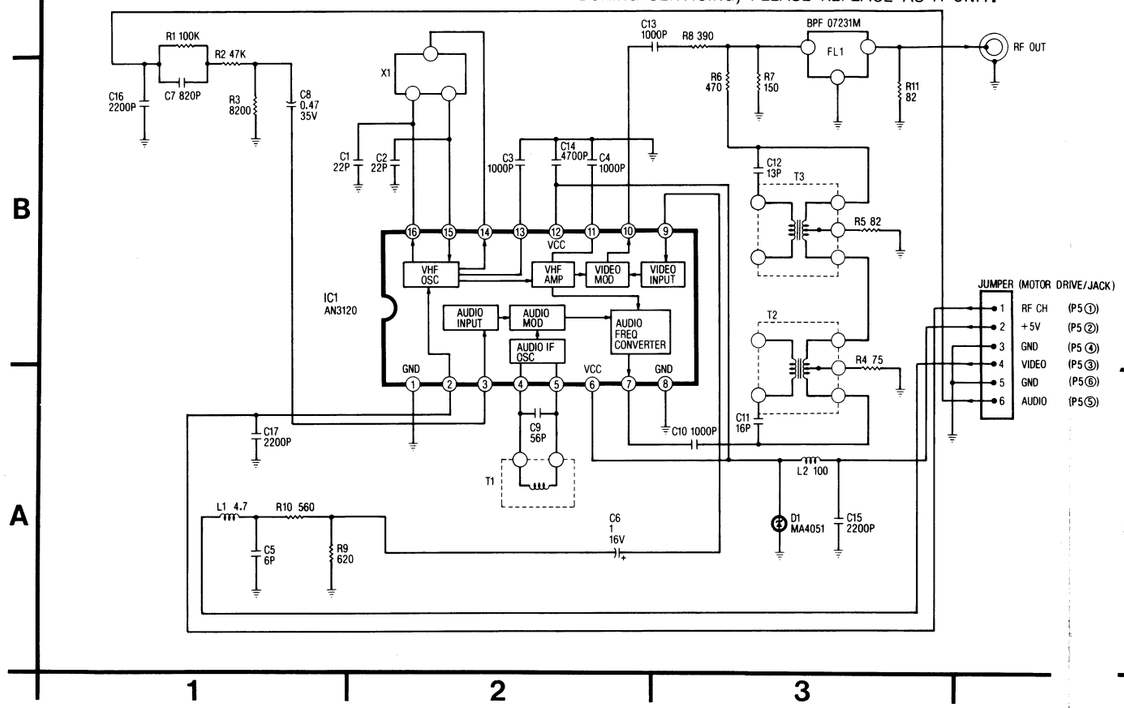
P22	
1	GND
2	VIDEO HEAD SP R CH
3	VIDEO HEAD SP R/L CH
4	VIDEO HEAD SP L CH
5	VIDEO HEAD LP/SLP R CH
6	VIDEO HEAD LP/SLP R/L CH
7	VIDEO HEAD LP/SLP L CH
8	GND

P23	
1	AUDIO HEAD L CH
2	AUDIO HEAD L CH
3	GND
4	AUDIO HEAD R CH
5	AUDIO HEAD R CH
6	GND
7	AUDIO ERASE HEAD
8	GND

PIN (DOLBY)	
1	AUDIO L CH IN (2)
2	GND
3	AUDIO L CH OUT (2)
4	AUDIO R CH OUT (2)
5	+9V
6	AUDIO R CH IN (2)
7	AUDIO R CH OUT (1)
8	DOLBY SW
9	AUDIO R CH IN (1)
10	AUDIO L CH IN (1)
11	AUDIO L CH OUT (1)

RF CONVERTER SCHEMATIC DIAGRAM

IMPORTANT NOTICE:
IF UNIT PARTS ARE REPLACED INDIVIDUALLY, THE FCC SPECIFICATIONS WILL NOT BE SATISFIED.
DURING SERVICING, PLEASE REPLACE AS A UNIT.



RF CONVERTER SCHEMATIC DIAGRAM

IMPORTANT NOTICE:
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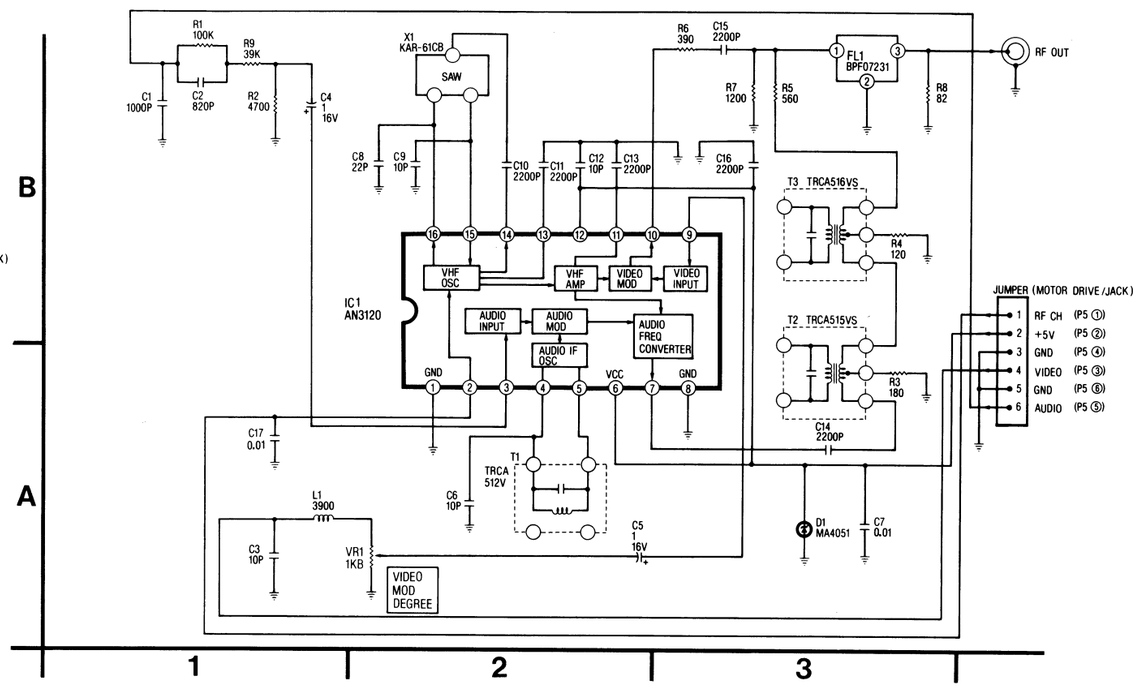
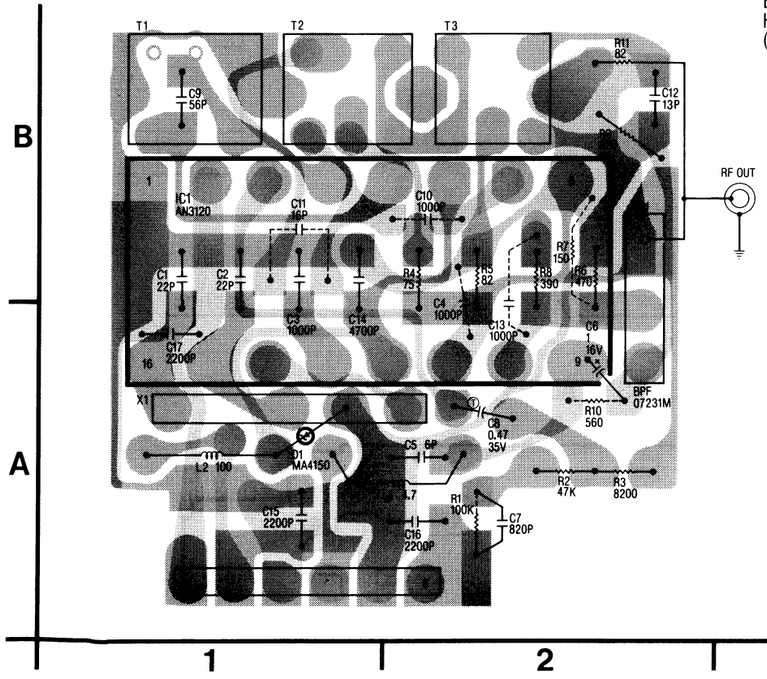
DURING SERVICING, PLEASE REPLACE AS A UNIT.

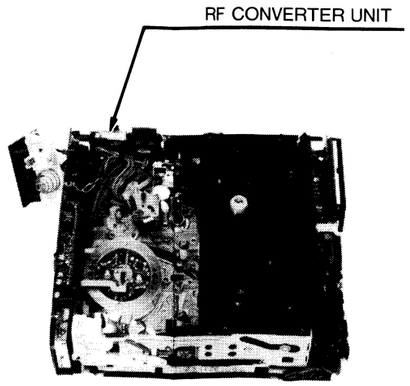


RF CONVERTER UNIT VEQS0256

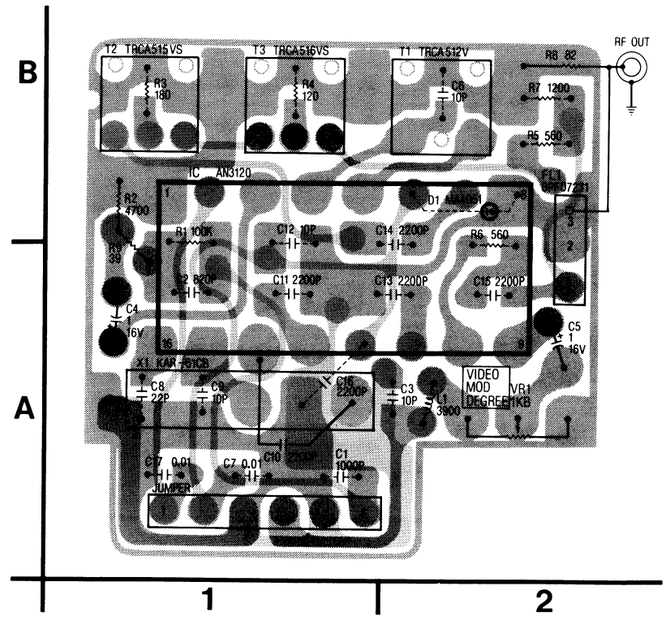


SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

IMPORTANT NOTICE:
IF UNIT PARTS ARE REPLACED INDIVIDUALLY, THE FCC SPECIFICATIONS WILL NOT BE SATISFIED.
DURING SERVICING, PLEASE REPLACE AS A UNIT.



RF CONVERTER UNIT ENC16801



SPECIAL NOTE:
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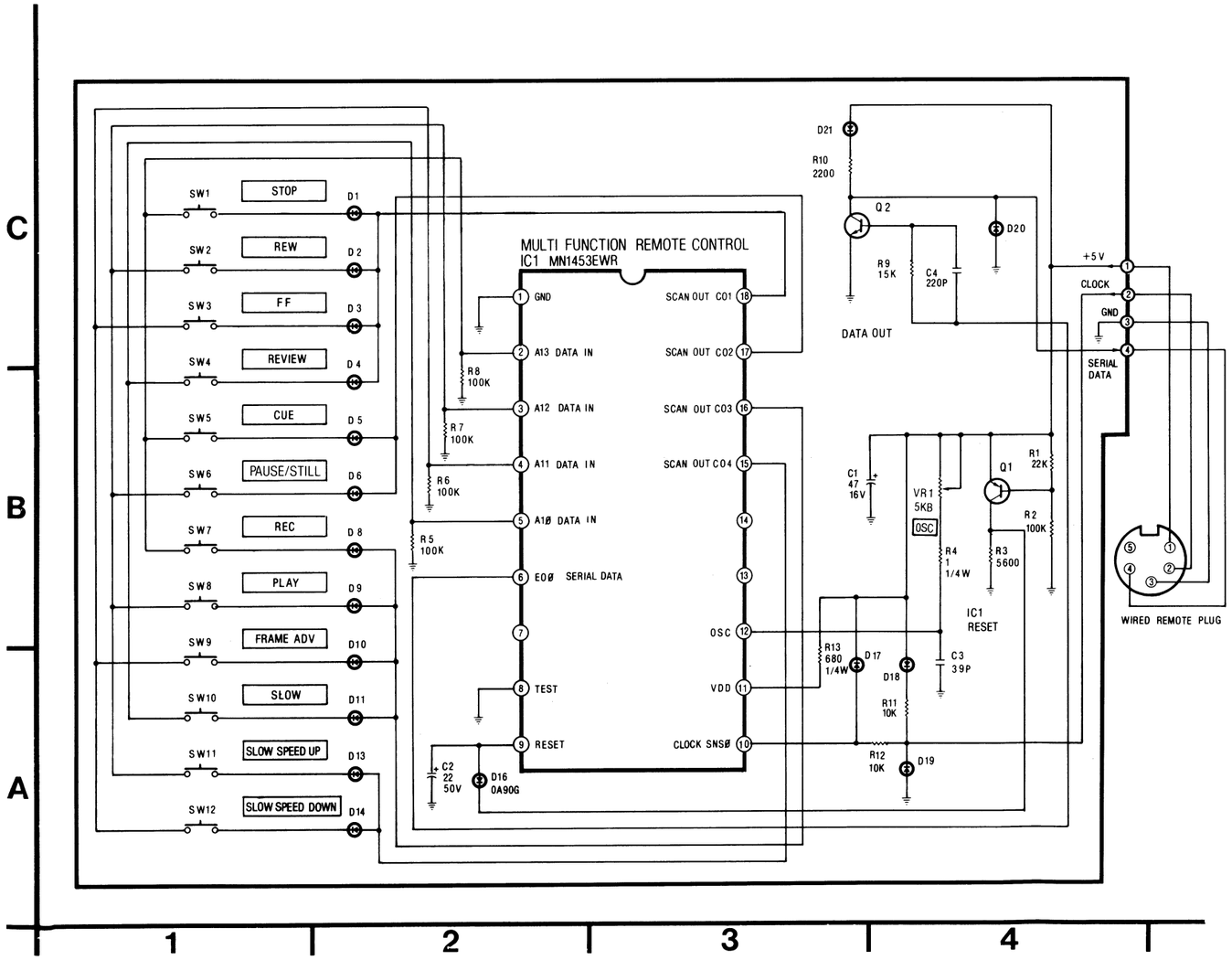
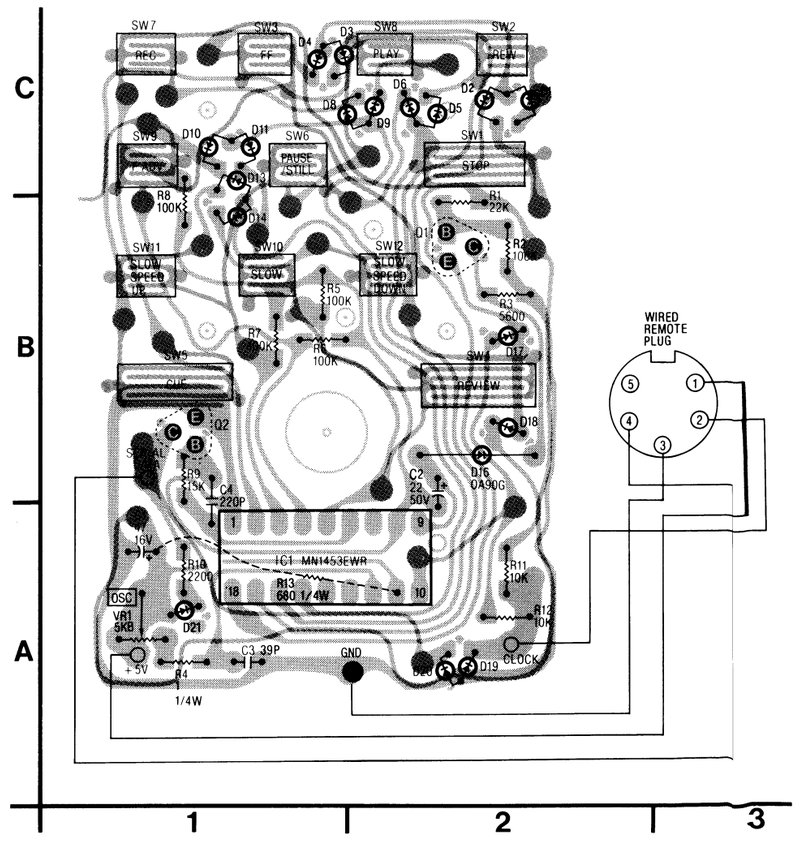
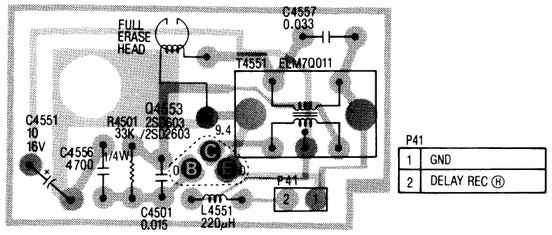




4-18
SMALL CIRCUIT
BOARDS

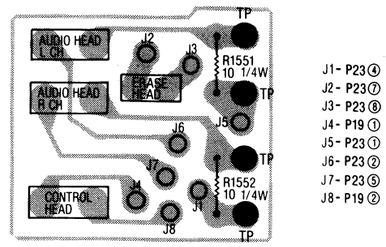
FULL ERASE HEAD C.B.A. VEPS0416A

VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN SP REC MODE.



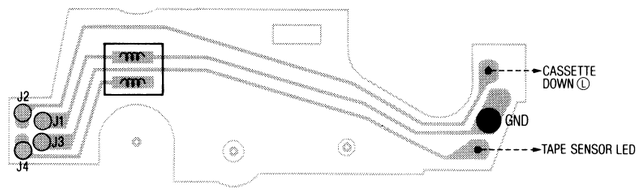
VJBS0416

AUDIO/CTL HEAD C.B.A.



VJBS00279

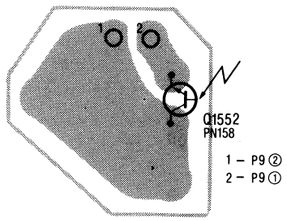
MAIN BRAKE SOLENOID C.B.A.



J1 — P15 ①
J2 — P15 ②
J3 — P15 ③
J4 — P15 ④

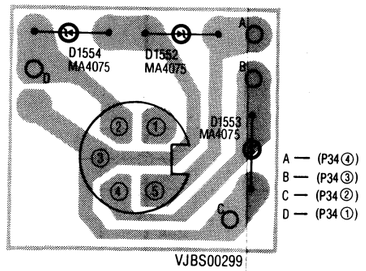
VJBS00303

SUPPLY PHOTO TR C.B.A.



VJBS00277

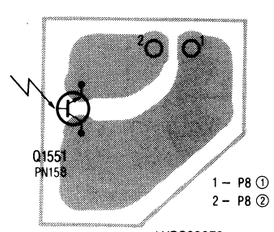
EDITING JACK C.B.A. VEKS1452



VJBS00299

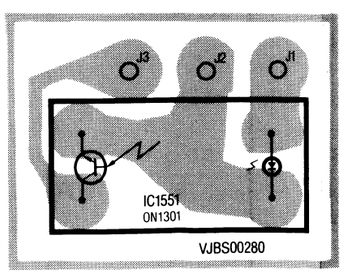
SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

TAKEUP PHOTO TR C.B.A.

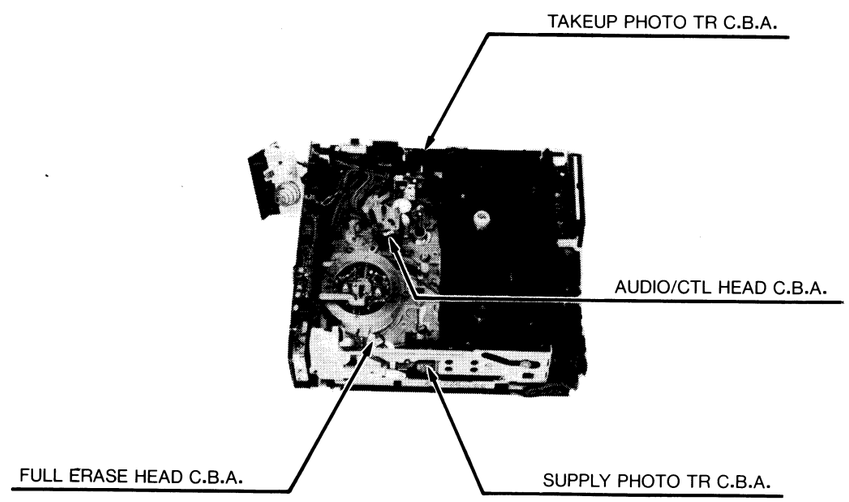


VJBS00276

TENSION SENSOR C.B.A.



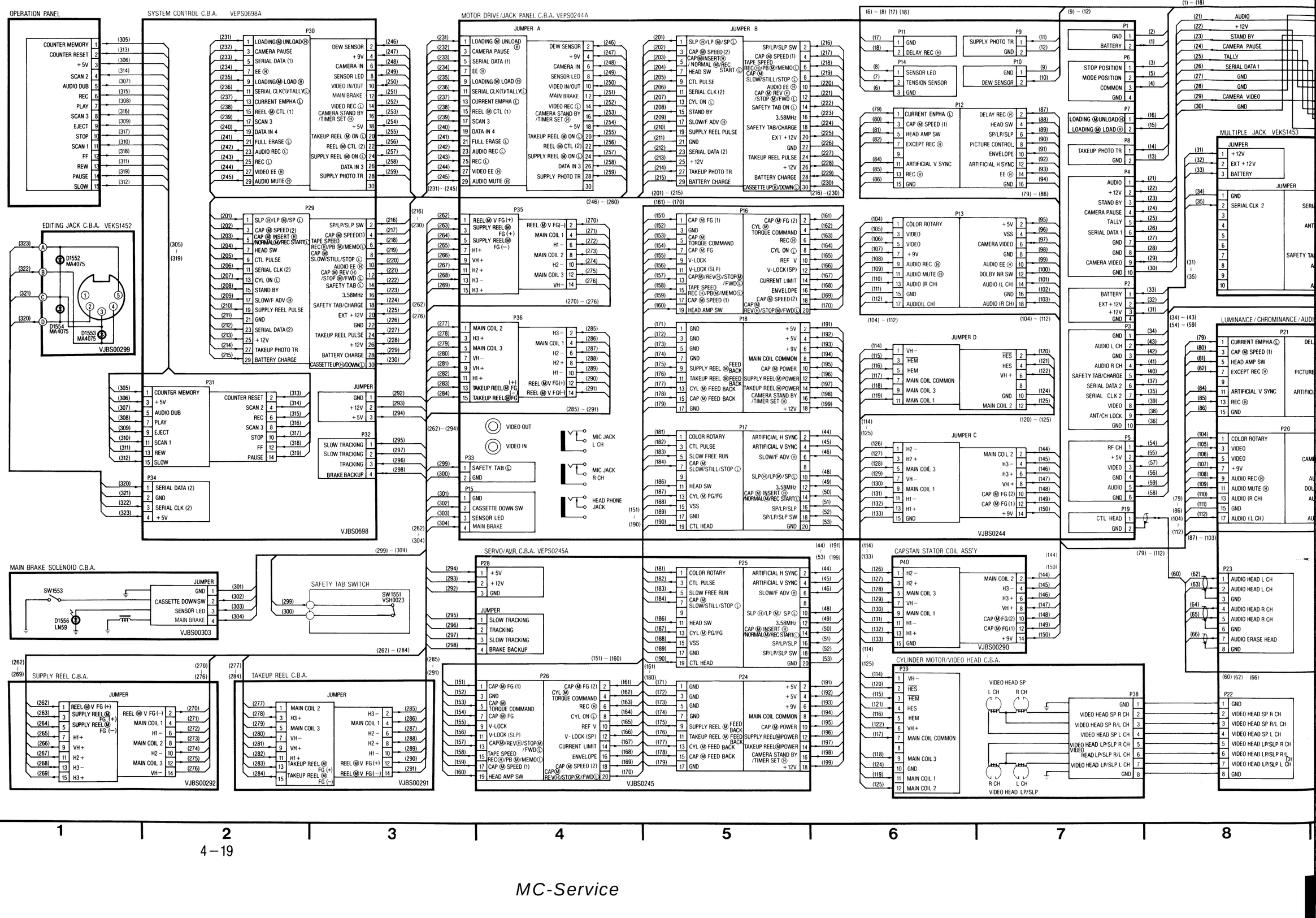
VJBS00280



INTERCONNECTION SCHEMATIC DIAGRAM

VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICOND
ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIR
HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTR
(ES) DEVICES" SECTION OF THIS SERVICE MANUAL.



VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

SPECIAL NOTE:
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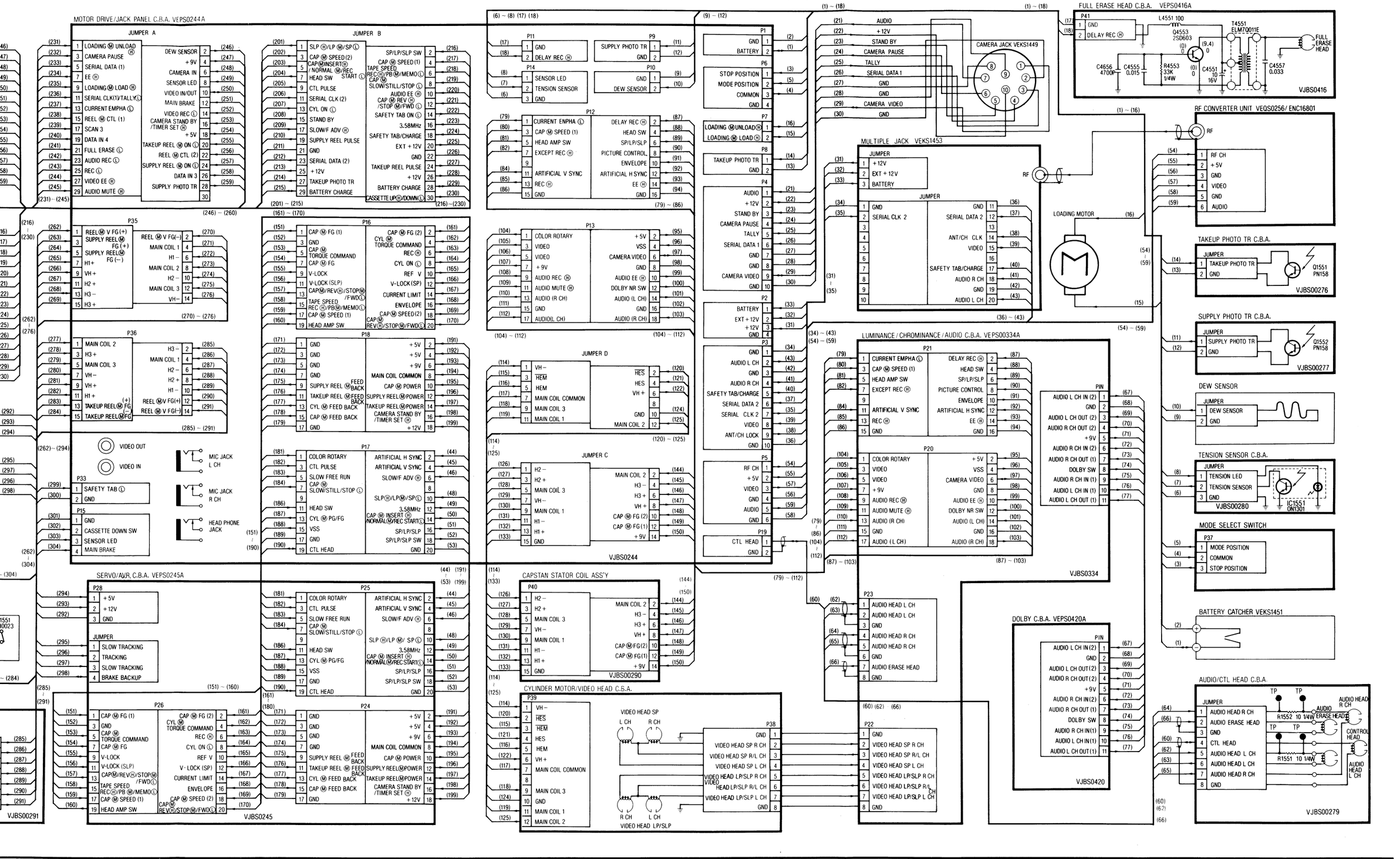


ORDER NO. VRD-8403-507

Service Manual

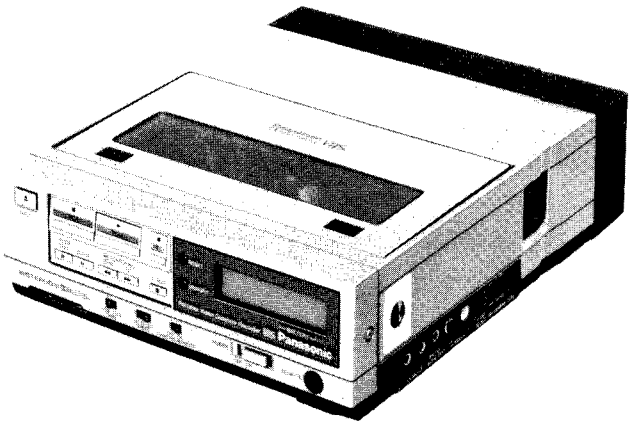
Video Cassette Recorder

Vol. 5'

Panasonic Omnivision VHS

PV-8000

Exploded Views
Replacement Parts Lists



SPECIFICATIONS

Power Source:	12V DC Battery PV-BP80 Prog. Tuner Unit PV-A820 PV-A850 PV-A860 Plug-in AC Adaptor PV-A118
Power Consumption:	Approx. 10 watts (16W with Camera)
Television System:	EIA Standard (525 lines, 60 fields) NTSC color signal
Video Recording System:	4 rotary heads, helical scanning system Luminance: FM azimuth recording Color signal: Converted subcarrier phase shift recording
Audio Track:	2 track
Tape Format:	Tape width 1/2" (12.7mm), high density tape
Tape Speed:	SP mode: 1-5/16 i.p.s. (33.35mm/s) LP mode: 21/32 i.p.s. (16.67mm/s) SLP mode: 7/16 i.p.s. (11.12mm/s)
Record/Playback Time:	8 HRS. with 160 min. type tape used in SLP mode
FF/REW Time:	Less than 6 min. with 120 min. type tape
Heads:	Video: 4 rotary heads Audio: 2 stationary heads Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing
Input Level:	Video: VIDEO IN Jack (RCA type) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack (Left, Right) −70dB, 4kΩ unbalanced
Output Level:	Video: VIDEO OUT Jack(RCA type) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack(RCA type) −9dB, 600Ω unbalanced RF Modulated: Ch3/Ch4 switchable, 72dBμ, (Open Voltage) 75Ω unbalanced
Video Horizontal Resolution:	Color: more than 230 lines B/W: more than 230 lines
Audio Frequency Response: (10dB down)	SP mode: 100Hz~8kHz LP mode: 100Hz~6kHz SLP mode: 150Hz~5kHz
Signal-to-Noise Ratio:	Video: SP mode: better than 41dB LP mode: better than 41dB SLP mode: better than 41dB (Rohde & Schwarz noise meter) Audio: SP mode: better than 42dB LP mode: better than 40dB SLP mode: better than 40dB
Operation Temperature:	32°F—104°F (0°C—40°C)
Operating Humidity:	10%—75%
Weight:	5.7 lbs. (2.6kg)
Dimensions:	8-7/16"(W)×2-3/4"(D)×10-7/8"(H) (215mm×69.5mm×263mm)

Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

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MC-Service

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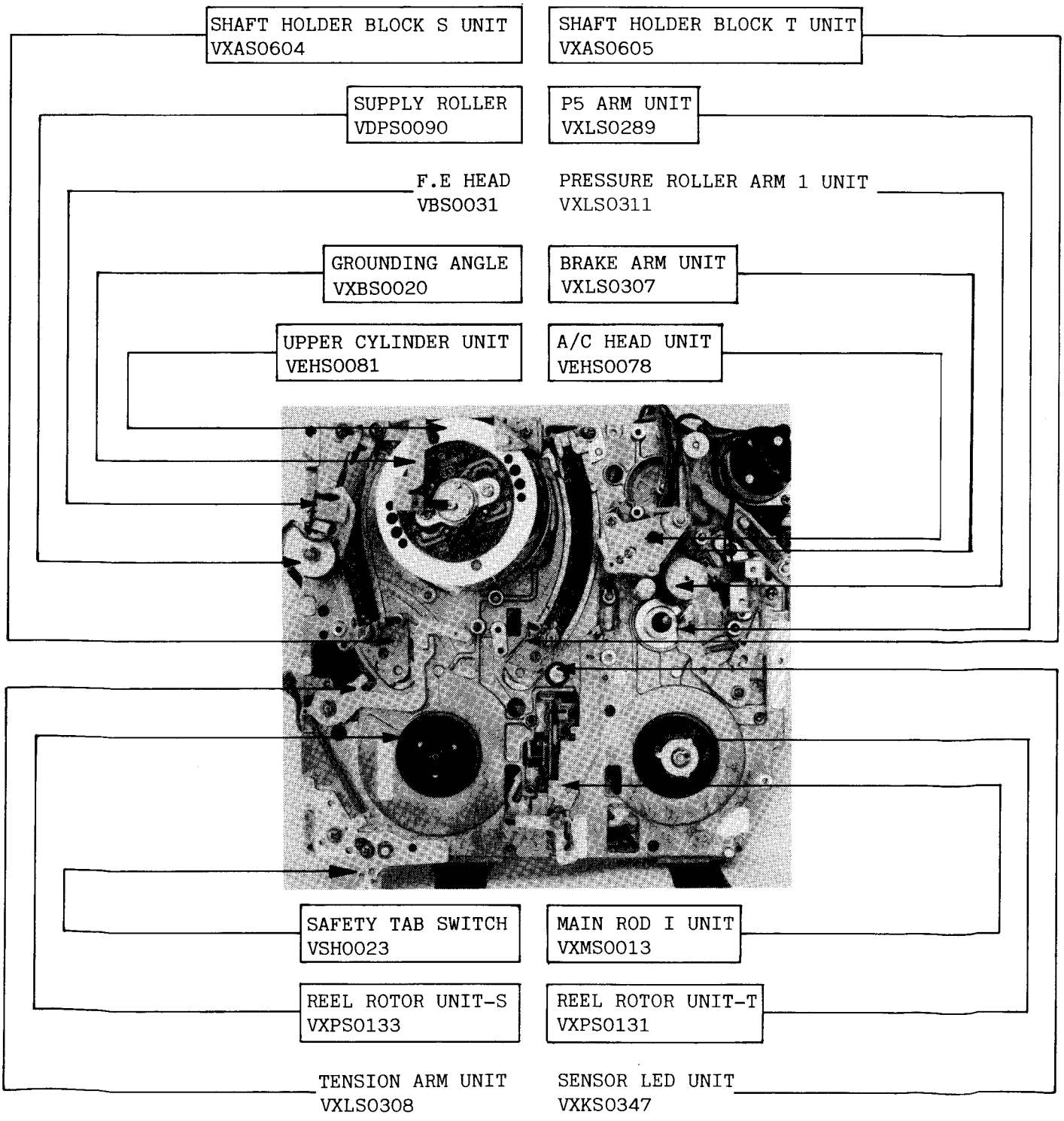
IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are shaded on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

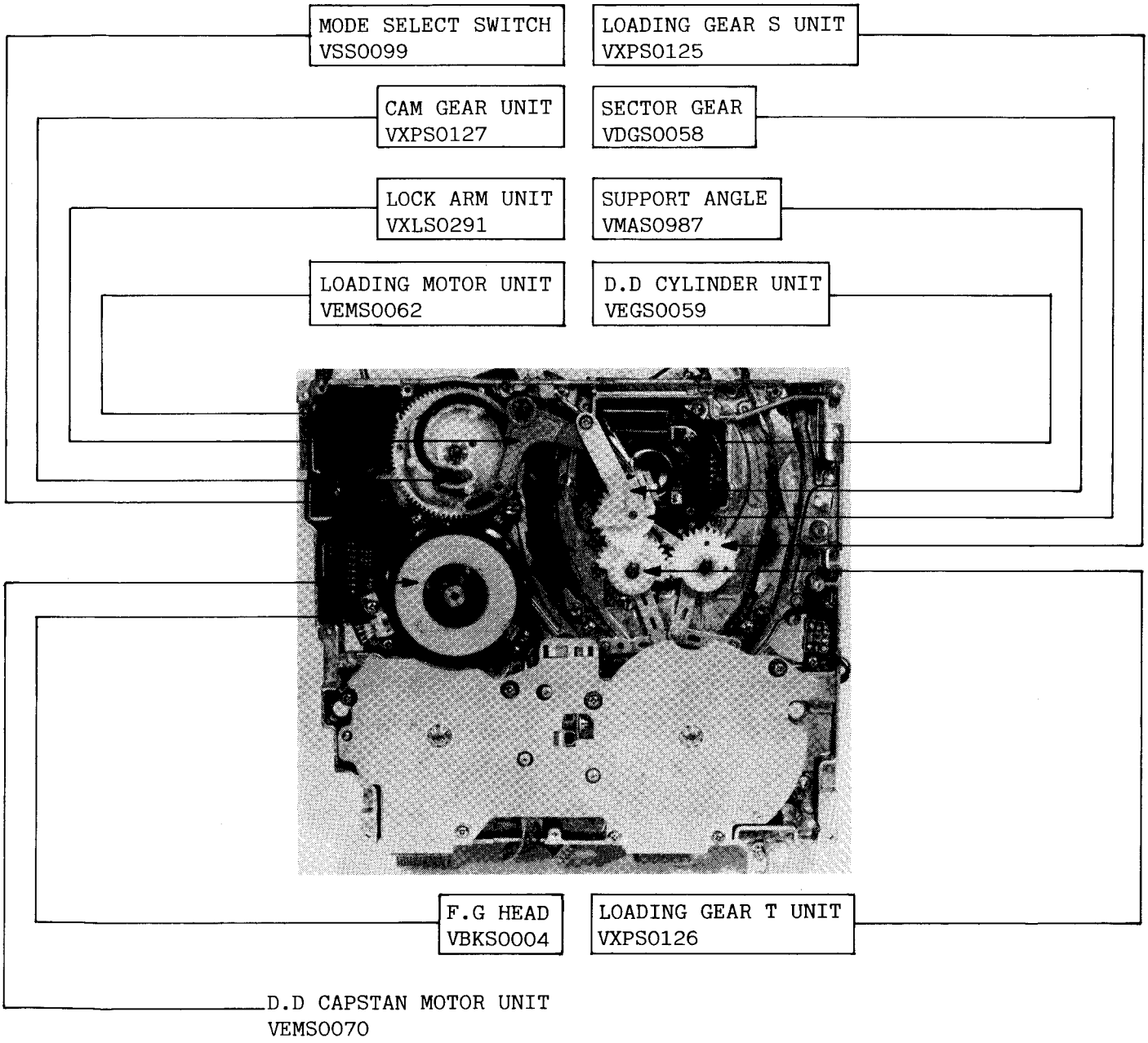
INNER PARTS LOCATION

TOP VIEW

Note:
When the Mechanical parts surrounded by rectangle are removed or replaced,be sure to perform necessary adjustment or confirmation procedures according to the mechanical adjustment procedures section.



BOTTOM VIEW

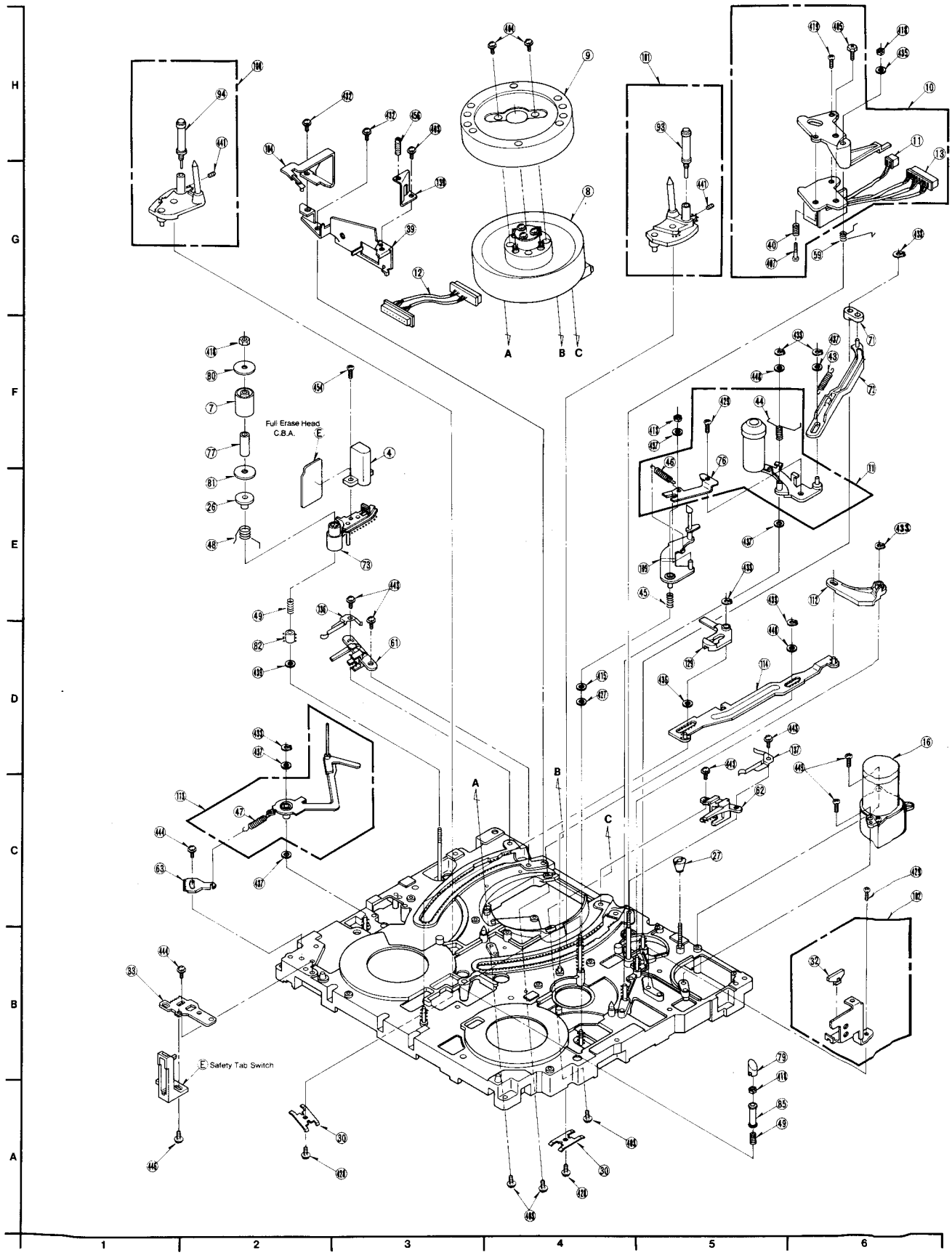


LUBRICATION POINTS

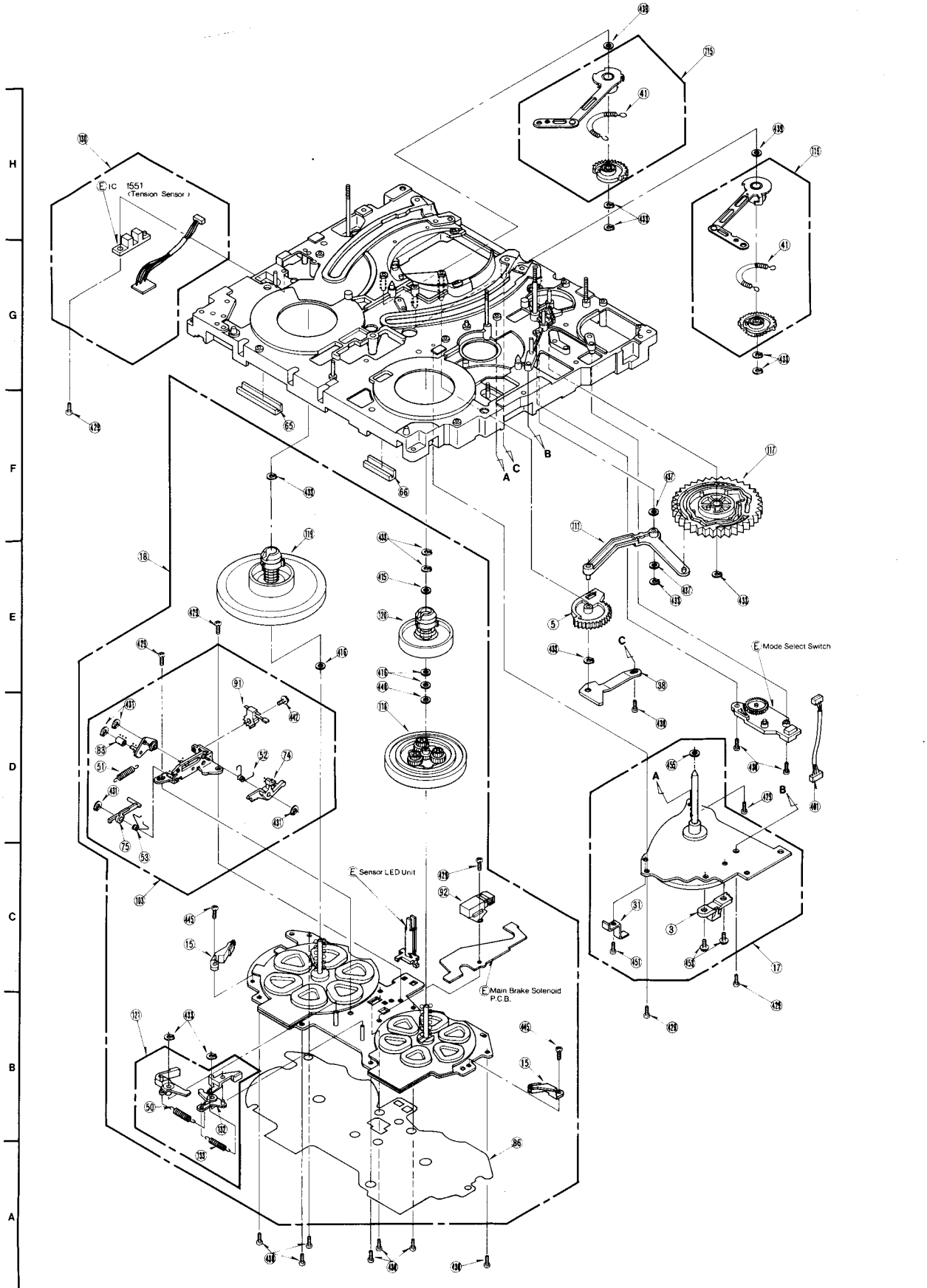
When the marked parts are replaced,apply the recommended lubricants or adhesive for better maintenance of the unit.

Marks	Kind of Lubricant	Availability	Part Number
× × ×	Molytone Grease	Available From Factory	MOR265
○ ○ ○	Spindle Oil	Purchase From Local Supplier	.....
△ △ △	Gummed Adhesive	Purchase From Local Supplier	.....

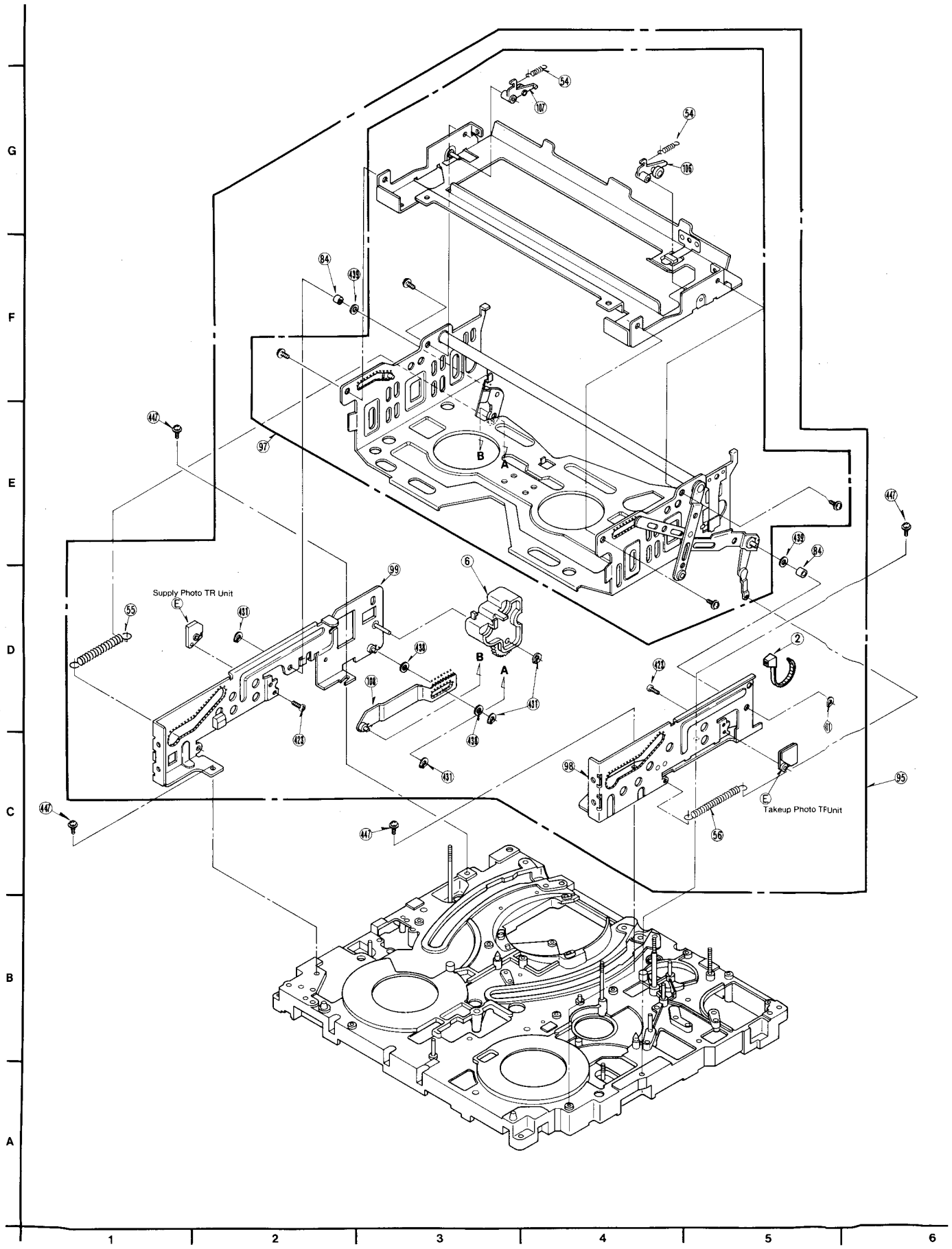
EXPLODED VIEWS ❶ *Transport Section*



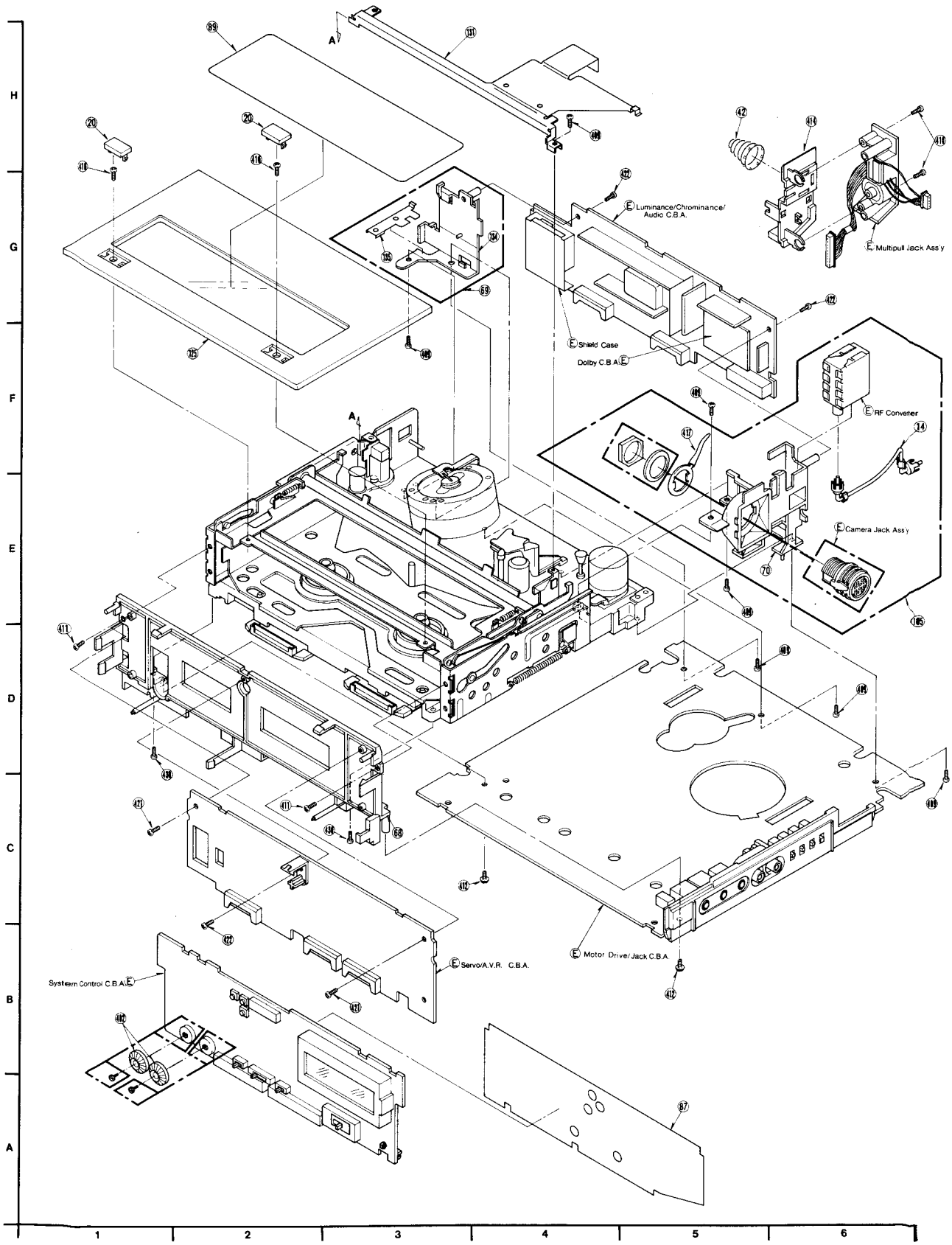
❷ Moving Mechanism Section



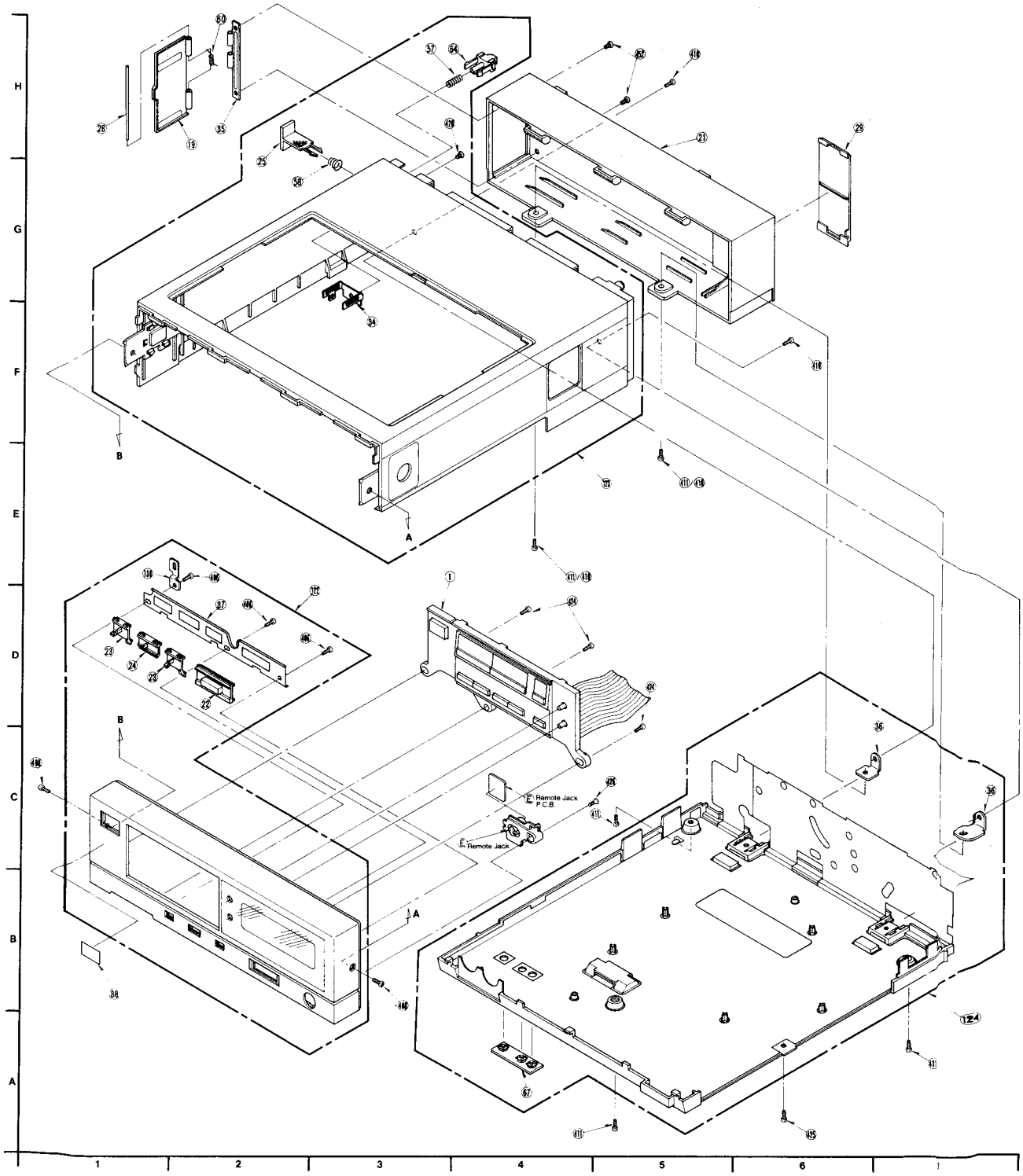
❸ Cassette Up Mechanism Section



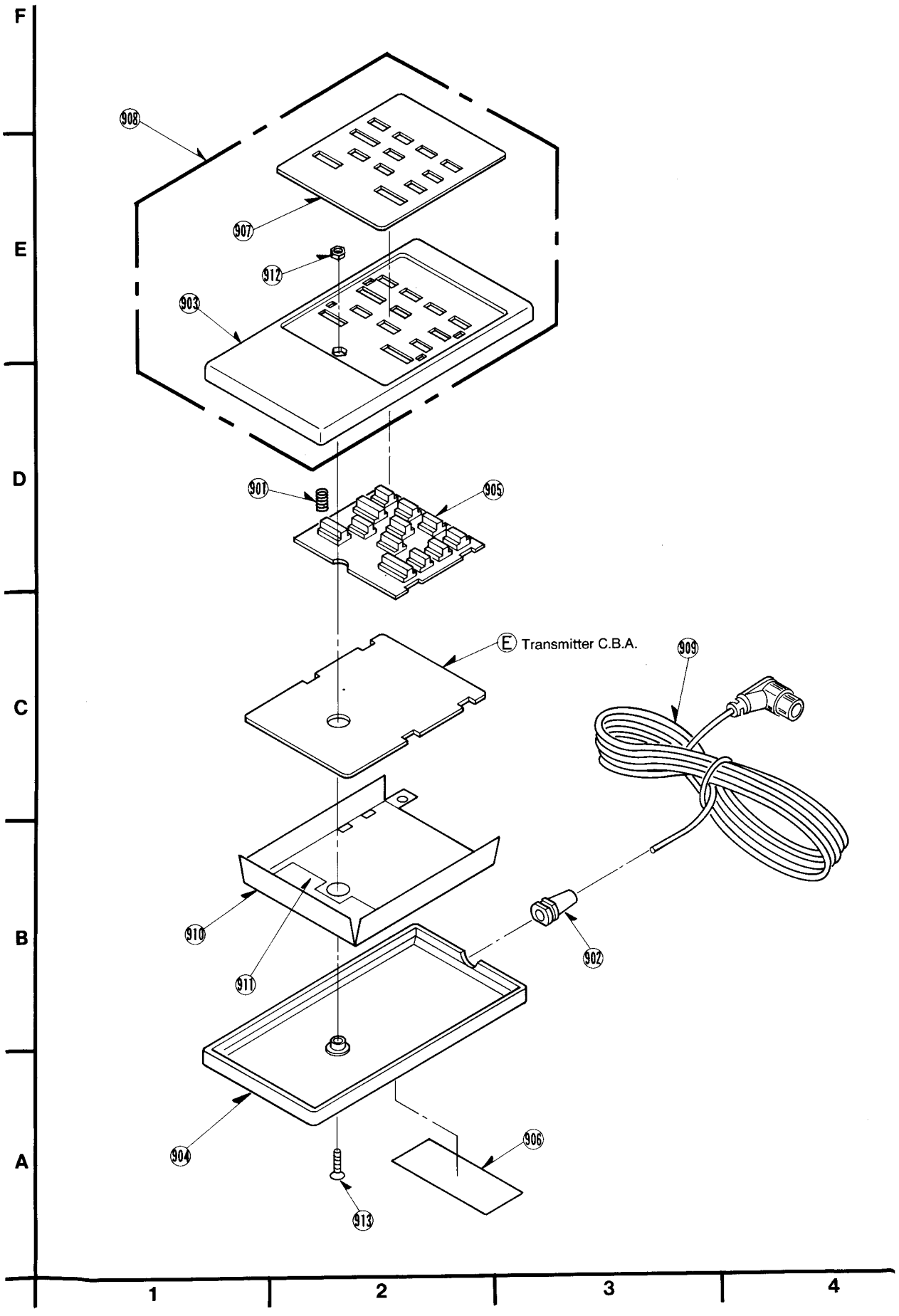
❹ *Chassis Frame Section*



❺ Casing Parts Section



❻ *Wired Transmitter Unit Section (PV-8000)*



MECHANICAL REPLACEMENT PARTS LIST

Model No. PV-8000

Note: Be sure to make your orders of replacement parts according to this list.

Item No.	Drawing No.	Description	Pcs/ Set	Part No.	Remark
1	5	OPERATION BUTTON UNIT	1	ESU-1215	
2	3	FASTENER	1	T18S	
3	2	F.G HEAD	1	VBKS0004	
4	1	F.E HEAD	1	VBS0031	
5	2	SECTOR GEAR	1	VDGS0058	
6	3	DAMPER UNIT	1	VDG0169	
7	1	SUPPLY ROLLER	1	VDPS0090	
8	1	D.D CYLINDER UNIT	1	VEGS0059	
9	1	UPPER CYLINDER UNIT	1	VEHS0081	
10	1	A/C HEAD UNIT	1	VEHS0078	
11	1	CONNECTOR ASS'Y	1	VEKS1466	
12	1	CONNECTOR ASS'Y	1	VEKS1467	
13	1	CONNECTOR ASS'Y	1	VEKS1478	
14	4	RF CABLE	1	VEKS1472	
15	2	F.G HEAD UNIT	2	VEKS1599	
16	1	LOADING MOTOR UNIT	1	VEMS0062	
17	2	D.D CAPSTAN MOTOR UNIT	1	VEMS0070	
18	2	D.D REEL MOTOR UNIT	1	VEMS0072	
19	5	BATTERY DOOR	1	VGKS0617	
20	4	CASSETTE SCREW RUBBER	2	VGKS0618	
21	5	BATTERY CASE	1	VGPS0703	
22	5	POWER SELECT SWITCH KNOB	1	VGTS0128	
23	5	CAMERA REMOTE & SPEED SELECT SWITCH KNOB	2	VGTS0129	
24	5	SPEED SELECT SWITCH KNOB	1	VGTS0130	
25	5	BATTERY EJECT BUTTON	1	VGUS0714	
26	1	INERTIA ROLLER LIMITER	1	VHDS0043	
27	1	ADJUST NUT	1	VHNS0027	
28	5	BATTERY DOOR SHAFT	1	VMSS0162	
29	5	SLIDE DOOR	1	VKFS0255	
30	1	SHAFT HOLDER PLATE	2	VMAS0625	
31	2	STOPPER	1	VMAS0910	
32	1	CASSETTE OPENER COVER	1	VMAS0916	
33	1	SWITCH HOLDER	1	VMAS0917	
34	5	SWITCH ANGLE	1	VMAS0943	
35	5	BATTERY DOOR HINGE	1	VMAS0944	
36	5	BOTTOM CASE ANGLE	2	VMAS0945	
37	5	SELECT BUTTON HOLDER	1	VMAS0946	
38	2	SUPPORT ANGLE	1	VMAS0987	
39	1	GROUNDING PLATE ANGLE	1	VMAS1064	
40	1	ADJUST SPRING	1	VMBS0147	
41	2	LOADING GEAR SPRING	2	VMBS0353	
42	4	BATTERY PUSH SPRING	1	VMBS0383	
43	1	SPRING	1	VMBS0354	
44	1	IDLER SPRING	1	VMBS0355	
45	1	P5 ARM SPRING	1	VMBS0356	
46	1	SPRING	1	VMBS0357	
47	1	TENSION ARM SPRING	1	VMBS0359	
48	1	ERASE HEAD LEVER SPRING	1	VMBS0360	
49	1	SUPPLY INERTIA SPRING	2	VMBS0361	
50	2	BRAKE SPRING	1	VMBS0362	
51	2	LOCK PLATE SPRING	1	VMBS0365	
52	2	LOCK LEVER -A SPRING	1	VMBS0366	
53	2	LOCK LEVER -B SPRING	1	VMBS0367	
54	3	CASSETTE HOLDER -B SPRING	2	VMBS0368	
55	3	CASSETTE HOLDER SPRING -L	1	VMBS0369	
56	3	CASSETTE HOLDER SPRING -R	1	VMBS0370	
57	5	STOPPER SPRING	1	VMBS0429	
58	5	EJECT BUTTON SPRING	1	VMBS0381	
59	1	A/C HEAD SPRING	1	VMBS0396	
60	5	BATTERY DOOR SPRING	1	VMBS0413	
61	1	POST STOPPER -S	1	VMDS0218	
62	1	POST STOPPER -T	1	VMDS0219	
63	1	ADJUST HOOK	1	VMDS0227	
64	5	BATTERY STOPPER	1	VMDS0229	
65	2	STOPPER -S	1	VMGS0043	
66	2	STOPPER -T	1	VMGS0044	
67	5	V-LOCK CAP	1	VMGS0045	
68	4	FRONT FRAME	1	VMKS0058	
69	4	REAR FRAME LEFT UNIT	1	VXKS0364	
70	4	REAR FRAME -RIGHT	1	VMKS0067	
71	1	GUIDE LEVER	1	VMLS0323	
72	1	TOGGLE ARM	1	VMLS0324	
73	1	ERASE HEAD LEVER	1	VMLS0327	
74	2	LOCK LEVER -A	1	VMLS0332	
75	2	LOCK LEVER -B	1	VMLS0333	
76	1	KICK LEVER	1	VMLS0342	
77	1	COLLAR	1	VMXS0035	
78					
79	1	POST CAP -P.4	1	VMXS0129	
80	1	INERTIA ROLLER UPPER LIMITER	1	VMXS0349	
81	1	INERTIA ROLLER LOWER LIMITER	1	VMXS0350	
82	1	COLLAR	1	VMXS0352	
83	2	LOCK COLLAR	1	VMXS0354	
84	3	LOCK ROLLER	2	VMXS0361	
85	1	POST SLEEVE	1	VMXS0362	
86	2	BARRIER	1	VMZS0118	
87	4	BARRIER	1	VMZS0113	
88	5	G4 HEAD INDICATION STICKER	1	VQLS0038	
89	4	STICKER	1	VQLS0009	
90					
91	2	LEAF SWITCH	1	VSH0009	
92	2	MAIN BRAKE SOLENOID	1	VSJ0006	
93	1	ROLLER POST UNIT	1	VXAS0062	
94	1	ROLLER POST UNIT	1	VXAS0063	
95	3	CASSETTE UP UNIT	1	VXAS0094	
96					
97	3	CASSETTE HOLDER A UNIT	1	VXAS0098	
98	3	CASSETTE STAND R UNIT	1	VXAS0099	
99	3	CASSETTE STAND L UNIT	1	VXAS0000	
100	1	SHAFT HOLDER BLOCK S UNIT	1	VXAS0004	
101	1	SHAFT HOLDER BLOCK T UNIT	1	VXAS0005	
102	1	CASSETTE OPENER UNIT	1	VXAS0006	
103	2	CASSETTE LOCK UNIT	1	VXAS0007	
104	1	GROUNDING ANGLE	1	VXBS0020	
105	4	REAR FRAME RIGHT UNIT	1	VXKS0045	
106	3	CASSETTE HOLDING LEVER R UNIT	1	VXLS0086	
107	3	CASSETTE HOLDING LEVER L UNIT	1	VXLS0087	
108	3	RACK UNIT	1	VXLS0088	
109	1	P5 ARM UNIT	1	VXLS0089	
110	1	PRESSURE ROLLER ARM 1 UNIT	1	VXLS0011	
111	2	LOCK ARM UNIT	1	VXLS0021	
112	1	BRAKE ARM UNIT	1	VXLS0027	

Item No.	Drawing No.	Description	Pcs/ Set	Part No.	Remark
113	1	TENSION ARM UNIT	1	VXLS0308	
114	1	MAIN ROD I UNIT	1	VXMS0013	
115	2	LOADING GEAR S UNIT	1	VXPS0125	
116	2	LOADING GEAR T UNIT	1	VXPS0126	
117	2	CAM GEAR UNIT	1	VXPS0127	
118	2	REEL ROTOR UNIT -T	1	VXPS0131	
119	2	REEL ROTOR UNIT -S	1	VXPS0133	
120	2	TAKEUP REEL TABLE UNIT	1	VXRS0015	
121	2	BRAKE UNIT	1	VXZS0065	
122	5	FRONT PANEL I UNIT	1	VYPS1870	
123	5	TOP CASE UNIT	1	VYPS1871	
124	5	BOTTOM CASE UNIT	1	VYPS1872	
125	4	CASSETTE COVER UNIT	1	VYPS1874	
126					
127					
128					
129	1	BRAKE CAM LEVER	1	VMLS0326	
130	2	TENSION SENSOR UNIT	1	VEKS1479	
131	4	TOP SHIELD PLATE	1	VSCS0546	
132	2	BRAKE HOLDER -T	1	VMLS0329	
133	2	SPRING	1	VMBS0416	
134	4	REAR FRAME -LEFT	1	VMKS0060	
135	4	EARTH PLATE	1	VMAS1036	
136	1	SUPPLY SLIDE LEAF SPRING	1	VMAS1037	
137	1	TAKEUP SLIDE LEAF SPRING	1	VMAS1038	
138	5	GROUNDING PLATE	1	VSCS0550	
139	1	THRUST HOLDER	1	VMAS1062	
401	2	CONNECTOR ASS'Y	1	VEKS1459	
402	4	TRACKING V.R KNOB	2	VGTS0131	
403	1	SCREW	4	VHDS0016	
404	1	SCREW WITH WASHER	2	VHDS0032	
405	1	A/C HEAD SCREW	1	VHDS0059	
406	5	TAPPING SCREW 3X4	3	VHDS0037	
407	1	ADJUST SCREW	1	VHDS0014	
408	5	SCREW	2	VHDS0066	
409	4	SCREW	7	VHDS0047	
410	4,5	SCREW	8	VHDS0067	
411	4,5	SCREW	7	VHDS0051	
412	4	SCREW	2	VHDS0056	
413	1	SCREW	1	VHNS0015	
414	4	BATTERY CATCHER	1	VJFS0008	
415	1,2	WASHER	2	VMXS0098	
416	2	WASHER	3	VNWS0004	
417	4	WASHER WITH CLAMPER	1	VNWS0005	
418	1	M3 NUT	3	XNG3B	
419	1	SCREW 2.6X8	1	XSN26+8	
420	5	TAPPING SCREW 2X6	1	XSS26+6	
421	4	TAPPING SCREW 2.6X6	2	XTB26+6A	
422	4	TAPPING SCREW 2.6X8	3	XTB26+8A	
423	3	TAPPING SCREW 2X4	2	XTN2+4G	
424	5	TAPPING SCREW 3X8	3	XTN3+8B	
425	5	TAPPING SCREW 2.6X8	1	XTS26+8AFZ	

Item No.	Drawing No.	Description	Pcs/ Set	Part No.	Remark
426	5	TAPPING SCREW 3X8	1	XTS3+8BFU	
427	1	POLY SLIDER WASHER 3	1	XWGV3A7G	
428	1	SCREW WITH WASHER 2.6X5	2	XYN26+C5	
429	1,2	TAPPING SCREW 2.6X6	9	XTV26+6F	
430	2,4	TAPPING SCREW 2.6X8	12	XTV26+8F	
431	2,3	RETAINING RING E-TYPE 2	9	XUC2FP	
432	1	SCREW WITH WASHER 2.6X6	2	XYN26+B6	
433	1,2	RETAINING RING C-TYPE 3	19	XUEV3VW	
434					
435	1	WASHER	1	XWE3D6	
436	1	POLY SLIDER WASHER 3	1	XWGV3A54G	
437	1,2	POLY SLIDER WASHER 3	7	XWGV3D54G	
438	3	POLY SLIDER WASHER 3	2	XWXV3D7	
439	1,2,3	POLY SLIDER WASHER 3	5	XWGV3D9G	
440	2	POLY SLIDER WASHER 3	1	XWXV3D54	
441	1	HEX. SCREW	2	XXE2C25FP	
442	2	SCREW WITH WASHER 2X8	1	XYE2+CF8	
443	1	SCREW WITH WASHER 2.6X10	4	XYE26+BF10	
444	1	SCREW WITH WASHER 2.6X8	2	XYE26+BF8	
445	2	SCREW WITH WASHER 2X5	2	XYN2+C5	
446	1	SCREW WITH WASHER 2.6X6	1	XYN26+F6S	
447	3	SCREW	4	VHDS0060	
448	1	POLY SLIDER WASHER 3	2	XWGV3D7G	
449	1	TAPPING SCREW 2.6X8	2	XTV26+8FR	
450					
451	2	SCREW 2.6X3	1	XSN26+3	
452	5	SCREW 2X4	2	XSS2+4FK	
453	2	SCREW WITH WASHER 2.6X5	2	XYN26+A5	
454	1	TAPPING SCREW 2.6X8	1	XTV26+8J	
455	2	CAPSTAN THRUST WASHER	1	VMXS0097	
456	1	THRUST SCREW	1	VMXS0092	
901	6	GROUNDING SPRING	1	MU16BN31	
902	6	BUSHING	1	MU16BS16A	
903	6	TOP CASE	1	MU16CS10H	
904	6	BOTTOM CASE	1	MU16CS11F	
905	6	RUBBER PLATE FOR CONTACT	1	MU16CT13A	
906	6	PART NO PLATE	1	MU16LB214	
907	6	TOP CASE DECORATION	1	MU16PP14P	
908	6	TOP CASE UNIT	1	MU16VCS110	
909	6	REMOTE CONTROL CABLE	1	MU16VPG4C	
910	6	SHIELD SHEET UNIT	1	MU16VSF48	
911	6	INSULATION PLATE	1	MU16XB34	
912	6	M2.6 NUT	1	URC18ONT20	
913	6	SCREW 2.6X10	1	XSS26+10FC	

Item No.	Drawing No.	Description	Pcs/ Set	Part No.	Remark
		SERVICING FIXTURES & TOOLS			
		VHS ALIGNMENT TAPE		VFMS0001H6	
		DIAL TORQUE GAUGE		VFK0133	
		PLASTIC CLAMPER		VFK0180	
		ADAPTOR FOR VFK0133		VFK0134	
		FINE ADJ. SCREWDRIVER		VFK0136	
		(for 3mmø Long Shaft)			
		POST ADJ. SCREWDRIVER		VFK0137	
		POST ADJ. PLATE		VFKS0010	
		REEL TABLE HEIGHT FIXTURE		VFKS0009	
		H-POSITION ADJ. FIXTURE		VFKS0003	
		V-HOLD ADJ. TOOL		VFKS0031	
		CASSETTE HOLDER FIXTURE		VFKS0017	
		V-STOPPER ADJ. FIXTURE		VFKS0034	
		RETAINING RING REMOVER		VFK0144	
		(for 3mmø)			
		HEAD CLEANING STICK		VFK27	
		MOLYTONE GREASE		MOR265	
		HEX WRENCH (for 0.9mmø)		VFK0146	
		EXTENSION CABLE KIT		VFKS0035	
		EXTENSION CABLE (A)		VFKS0036	
		EXTENSION CABLE (B)		VFKS0037	
		EXTENSION CONNECTOR (A)		VFKS0038	
		EXTENSION CONNECTOR (B)		VFKS0039	
		EXTENSION CONNECTOR (C)		VFKS0040	
		EXTENSION CONNECTOR (D)		VFKS0041	
		EXTENSION CABLE (C)		VFKS0042	
		MULTI EXTENSION CABLE		VFKS0043	
		EXTENSION CONNECTOR (E)		VFKS0044	

ELECTRICAL REPLACEMENT PARTS LIST

Model No. PV-8000

Special Note:
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "Electrostatically Sensitive (ES) Devices" section of this service manual.

Note:
1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
   Components identified by the sign ⚠ have special characteristics important for safety.
   When replacing any of these components, Use only the specified parts.
3. Unless otherwise specified;
   All resistors are in OHMS (Ω), 1/4W, ±5%, carbon, K=1,000Ω, M=1,000KΩ.
   All capacitors are in MICROFARADS (UF), P=UUF, ±10%.
   All coils are in MICROHENRIES (UH), M=10^3U, ±10%.
4. C.B.A.: Circuit Board Assembly.
5. P.C.B.: Print Circuit Board.

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
			PRINTED CIRCUIT BOARD ASSEMBLY		
		VEPS0244A	MOTOR DRIVE/JACK C.B.A	1	
		VEPS0245A	SERVO/A.V.R. C.B.A	1	
		VEPS0334A	LUMINANCE/CHROMINANCE/AUDIO	1	
			C.B.A		
		VEPS0698A	SYSTEM CONTROL C.B.A	1	
		VEPS0420A	DOLBY C.B.A	1	
		VEPS0416A	FULL ERASE HEAD C.B.A	1	
			MOTOR DRIVE/JACK C.B.A		
			INTEGRATED CIRCUITS		
IC2501		AN3830K		1	
IC2502		AN3810K		1	
IC2503		AN3620S		1	
IC2504		AN3830K		1	
IC2505		AN3821K		1	
IC6901		AN6552		1	
IC6902		VCRS0026		1	
IC6903		BU4066BF		1	
		OR MN4066BS			
		OR UPD4066BG			
IC6904		VCR0092		1	
			TRANSISTORS		
Q2501,2502		2SB641(Q,R,S)		2	
Q2503		2SD636(Q,R,S)		1	
Q2504		2SB641(Q,R,S)		1	
Q2505,2506		DTC144A		2	
		OR UN1213			
Q2507		2SD636(Q,R,S)		1	
Q6901		2SD636(R,S)		1	
Q6902		2SD1458		1	
Q6903		2SC2021M(Q,R,S)		1	
		OR			
		2SD636(Q,R,S)			
Q6904		2SD637(Q,R,S)		1	
Q6905		DTC124A		1	
		OR UN1212			
Q6906		2SC1545		1	
			DIODES		
D2501		MA165		1	
		OR 1SS119			
D2502		MA154WA		1	
D2503-2510		MA165		8	
		OR 1SS119			
D6901		MA4270	ZENER	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
D6902,6903	MA4075	ZENER	2	
D6904,6905	MA4130	ZENER	2	
D6906	ERC81-004		1	
	OR S3S4M			
D6907,6908	MA4270	ZENER	2	
D6909,6910	MA165		2	
	OR 1SS119			
D6911,6912	MA4130	ZENER	2	
D6913	MA165		1	
	OR 1SS119			
D6914	MA4270	ZENER	1	
D6915,6916	MA4075	ZENER	2	
D6917,6918	MA4270	ZENER	2	
D6919,6920	RD9.1EW	ZENER	2	
D6923,6924	MA4270	ZENER	2	
D6925	MA4062	ZENER	1	
		RESISTORS		
R2501	ERDS2TJ181	180	1	
R2503	ERDS2TJ102	1K	1	
R2504	ERDS2TAJR56	0.56	1	
	OR ERDS2TJR56	0.56		
R2505	ERDS2TJ120	12	1	
R2506	ERDS2TAJR56	0.56	1	
	OR ERDS2TJR56	0.56		
R2507	ERDS2TJ4R7	4.7	1	
R2508	ERDS2TJ333	33K	1	
R2509	ERDS2TJ124	120K	1	
R2510	ERDS2TJ104	100K	1	
R2511	ERDS2TJ563	56K	1	
R2512	ERDS2TJ682	6.8K	1	
R2513	ERDS2TJ334	330K	1	
R2514	ERDS2TJ223	22K	1	
R2515	ERDS2TJ823	82K	1	
R2516,2517	ERDS2TJ683	68K	2	
R2518	ERDS2TJ223	22K	1	
R2519	ERDS2TJ123	12K	1	
R2520	ERDS2TJ221	220	1	
R2521	ERDS2TJ181	180	1	
R2522	ERDS2TJ681	680	1	
R2523	ERDS2TAJR56	0.56	1	
	OR ERDS2TJR56	0.56		
R2524	ERDS2TJ104	100K	1	
R2525	ERDS2TJ223	22K	1	
R2526	ERDS2TJ103	10K	1	
R2527	ERDS2TJ221	220	1	
R2528-2530	ERDS2TJ224	220K	3	
R2531	ERDS2TAJR68	0.68	1	
	OR ERDS2TJR68	0.68		
R2532	ERDS2TJ392	3.9K	1	
R2533	ERDS2TJ223	22K	1	
R2534	ERDS2TJ272	2.7K	1	
R2535	ERDS2TJ392	3.9K	1	
R2536,2537	EVN3ACA00B15	VARIABLE 100K	2	
R2538	ERDS2TJ120	12	1	
R2539	ERDS2TJ183	18K	1	
R2540	ERDS2TJ153	15K	1	
R2541	ERDS2TJ224	220K	1	
R2542	ERDS2TJ102	1K	1	
R2543	ERDS2TJ4R7	4.7	1	
R2544	ERDS2TJ680	68	1	
R2545	ERDS2TJ4R7	4.7	1	
R2546	ERDS2TJ563	56K	1	
R2547	ERDS2TJ224	220K	1	
R2548	ERDS2TJ223	22K	1	
R2549,2550	ERDS2TJ473	47K	2	
R2551	ERDS2TJ105	1M	1	
R6901	ERDS2TJ270	27	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R6902,6903	ERDS2TJ100	10	2	
R6904	ERDS2TJ102	1K	1	
R6905	ERDS2TJ561	560	1	
R6906	ERDS2EJ101	100	1	
R6907,6908	ERDS2TJ151	150	2	
R6909,6910	ERDS2TJ333	33K	2	
R6911	ERDS2TJ332	3.3K	1	
R6912	ERDS2EJ154	150K	1	
R6913	ERDS2EJ152	1.5K	1	
R6914	ERDS2TJ101	100	1	
R6915	ERDS2EJ273	27K	1	
R6916	ERDS2EJ473	47K	1	
R6917	ERDS2TJ473	47K	1	
R6918	ERDS2TJ273	27K	1	
R6919	ERDS2TJ563	56K	1	
R6920,6921	ERDS2TJ273	27K	2	
R6923	ERDS2TJ750	75	1	
R6924	ERDS2TJ680	68	1	
R6925	ERDS2EJ473	47K	1	
R6926	ERDS2TJ473	47K	1	
R6927,6928	ERDS2TJ563	56K	2	
R6929	ERDS2EJ223	22K	1	
R6930	ERDS2EJ103	10K	1	
R6931	ERDS2TJ222	2.2K	1	
R6932	ERDS2TJ223	22K	1	
R6933	ERDS2TJ100	10	1	
R6935	ERDS2TJ102	1K	1	
R6937	ERDS2TJ331	330	1	
R6940	ERDS2EJ100	10	1	
R6941	ERDS2TJ392	3.9K	1	
R6942	ERDS2TJ100	10	1	
R6943	ERDS2TJ273	27K	1	
R6944	EVN3ACA00B24	VARIABLE 20K	1	
R6945	ERDS2TJ392	3.9K	1	
R6946	ERDS2TJ472	4.7K	1	
R6948	ERDS2TJ103	10K	1	
R6949	ERDS2TJ560	56	1	
R6950	ERDS2TJ472	4.7K	1	
		CAPACITORS		
C2501	ECEA1EKK0R1	ELECTROLYTIC 25V 0.1	1	
C2502	ECEA1EKKR47	ELECTROLYTIC 25V 0.47	1	
C2503-2505	ECEA1EKK4R7	ELECTROLYTIC 25V 4.7	3	
C2506	ECEA1CK101X	ELECTROLYTIC 16V 100	1	
C2507,2508	ECKZ1H103ZV	CERAMIC 50V 0.01 +80%-20%	2	
C2509	ECEA1EKKR22	ELECTROLYTIC 50V 0.22	1	
C2510	ECQB1H123KH	POLYESTER 50V 0.012	1	
C2511	ECQB1H682KH	POLYESTER 50V 0.0068	1	
C2512	ECEA1EKK3R3	ELECTROLYTIC 25V 3.3	1	
C2513-2515	ECEA1CSN100	ELECTROLYTIC 16V 10	3	
C2516	ECCZ1H101J	CERAMIC 50V 100P +-5%	1	
	OR ECCZ1H101J6	CERAMIC 50V 100P +-5%		
C2517	ECCZ1H181J	CERAMIC 50V 180P +-5%	1	
	OR ECCZ1H181J6	CERAMIC 50V 180P +-5%		
C2518	VCYSBDC473MX	CERAMIC 50V 0.047 +-2%	1	
C2519	ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C2520	ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C2521	ECEA1EKKR22	ELECTROLYTIC 25V 0.22	1	
C2522	ECEA1VSN2R2	ELECTROLYTIC 35V 2.2	1	
C2523	ECEA1EKKR22	ELECTROLYTIC 25V 0.22	1	
C2524	ECEA1EKK4R7	ELECTROLYTIC 25V 4.7	1	
C2525	ECEA1EKK0R1	ELECTROLYTIC 25V 0.1	1	
C2526	ECEA1EKKR47	ELECTROLYTIC 25V 0.47	1	
C2527-2529	ECEA1EKK4R7	ELECTROLYTIC 25V 4.7	3	
C2530	VCYSBDC104MX	CERAMIC 16V 0.1 +-2%	1	
C2531	ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C2532	ECEA0GKS470	ELECTROLYTIC 6.3V 4.7	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C2533-2535	ECEA1VSN2R2	ELECTROLYTIC 35V 2.2	3	
C2536	ECEA1AKS470	ELECTROLYTIC 10V 47	1	
C2537	ECKZ1H102KB	CERAMIC 50V 0.001	1	
	OR ECKZ1H102KB6	CERAMIC 50V 0.001		
C2538	VCYSBDC223MX	CERAMIC 16V 0.022 +-20%	1	
C2539	ECEA1CKK100	ELECTROLYTIC 16V 10	1	
C2541-2546	VCYSBDC473MX	CERAMIC 16V 0.047 +-20%	6	
C2547	ECEA1CK101X	ELECTROLYTIC 16V 100	1	
C2548	ECEA1EKK2R2	ELECTROLYTIC 25V 2.2	1	
C2549	ECKZ1H103ZV	CERAMIC 50V 0.01	1	
		+80%-20%		
C2550-2552	VCYSBDC223MX	CERAMIC 16V 0.022 +-20%	3	
C6901	ECEA1EKS220	ELECTROLYTIC 25V 22	1	
C6902	ECEA1CKK100	ELECTROLYTIC 16V 10	1	
C6903,6904	ECEBOJK220	ELECTROLYTIC 6.3V 22	2	
C6905,6906	VCYS0001	MULTI FUNCTION 0.01	2	
C6907	ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C6908	VCYSBDC333MX	CERAMIC 16V 0.033 +-20%	1	
C6909	ECKZ1H103ZV	CERAMIC 50V 0.01	1	
		+80%-20%		
C6910	ECEA1CKS470	ELECTROLYTIC 16V 47	1	
C6911	ECEA1EKK3R3	ELECTROLYTIC 25V 3.3	1	
C6912	ECEA1AKS330	ELECTROLYTIC 10V 33	1	
C6913	ECEA1EKK3R3	ELECTROLYTIC 25V 3.3	1	
C6914	ECEAOJKS470	ELECTROLYTIC 6.3V 47	1	
C6915	ECEA1EKK3R3	ELECTROLYTIC 25V 3.3	1	
C6916	ECEA1AKS330	ELECTROLYTIC 10V 33	1	
C6917	ECEA1EKK3R3	ELECTROLYTIC 25V 3.3	1	
C6918,6919	ECEA1EKK010	ELECTROLYTIC 25V 1	2	
C6920	ECEA1HSN010	ELECTROLYTIC 50V 1	1	
C6921	ECKZ1H103ZV	CERAMIC 50V 0.01	1	
		+80%-20%		
C6922	ECEA1CKS470	ELECTROLYTIC 16V 47	1	
C6923,6924	VCYSARH820KB	CERAMIC 50V 82	2	
C6925	ECEA1AKS330	ELECTROLYTIC 10V 33	1	
C6926,6927	ECKZ1H102KB6	CERAMIC 50V 0.001	2	
C6928	ECEA1CKK100	ELECTROLYTIC 16V 10	1	
C6929	ECKF1H223ZF	CERAMIC 50V 0.022	1	
		+80%-20%		
		PIN HEADERS		
JA1,2	VJPS0152	FLEXIBLE 15P	2	
JB1,2	VJPS0152	FLEXIBLE 15P	2	
JC1	VJPS0150	FLEXIBLE 7P	1	
JC2	VJPS0151	FLEXIBLE 7P	1	
JD1,2	VJPS0149	FLEXIBLE 6P	2	
P1	VJPS0080	2P	1	
P10,11	VJPS0072	2P	2	
P12	VJSS0143	16P	1	
P13	VJSS0144	18P	1	
P14	VJPS0081	3P	1	
P15	VJPS0074	4P	1	
P16,17	VJSS0145	20P	2	
P18	VJSS0144	18P	1	
P19	VJPS0072	2P	1	
P2	VJPS0082	4P	1	
P3	VJPS0086	10P	1	
P33	VJPS0072	2P	1	
P35,36	VJSS0148	FLEXIBLE 15P	2	
P4	VJPS0078	10P	1	
P5	VJPS0076	6P	1	
P6	VJPS0074	4P	1	
P7-9	VJPS0072	2P	3	
		SWITCHES		
SW6901	VSSS0016	SELECT	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
SW6902,6903	VSSS0015	SELECT	2	
SW6904	VSSS0026	SELECT	1	
		RELAY		
RL6901	VSYS0014		1	
		MISCELLANEOUS		
	VJBS00314	FLEXIBLE WIRES	1	
	VJBS00315	FLEXIBLE WIRES	1	
	VJBS00318	FLEXIBLE WIRES	1	
	VJBS00319	FLEXIBLE WIRES	1	
	VJJS0041	MIC JACK	2	
	VJJS0059	JACK PLATE	1	
	VKCS0008	HINGE	2	
	VMTS0035	CUSHION	6	
	VMXS0367	SPACER	1	
	VMZS0084	INSULATOR SHEET	4	
	VMZS0114	BARRIER	1	
	VMZS0115	BARRIER	1	
	VMZS0116	BARRIER	1	
		SERVO/A.V.R. C.B.A		
		INTEGRATED CIRCUITS		
IC1001	BA6149LS		1	
IC1002	⚠ UN101		1	
IC2001	AN3610K		1	
IC2002	UPC1515CA		1	
IC2003	VCR0094		1	
IC2004	AN3710S		1	
		TRANSISTORS		
Q1001	2SD992(L,K)		1	
Q2001	DTC144A		1	
	OR UN1213			
Q2002	2SB641(Q,R,S)		1	
Q2003	DTC144A		1	
	OR UN1213			
Q2004,2005	2SB641(Q,R,S)		2	
Q2006-2008	2SD636(Q,R,S)		3	
Q2009	DTC144A		1	
	OR UN1213			
Q2010	2SD636(Q,R,S)		1	
Q2012	2SD636(Q,R,S)		1	
		DIODES		
D1001	MA154WK		1	
D2001-2003	MA165		3	
	OR 1SS119			
D2004	MA156		1	
D2005,2006	MA165		2	
	OR 1SS119			
D2007,2008	MA154WA		2	
D2009	MA165		1	
	OR 1SS119			
D2011	MA165		1	
	OR 1SS119			

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		RESISTORS		
R1001	ERDS2TJ154	150K	1	
R1002	ERDS2TJ473	47K	1	
R1003	ERDS2TJ103	10K	1	
R1004	ERDS2TJ222	2.2K	1	
R1005	ERDS2TJ472	4.7K	1	
R1006	ERDS2TJ103	10K	1	
R1007	ERDS2TJ154	150K	1	
R1008-1011	ERDS2TJ122	1.2K	4	
R1012	ERDS2TJ821	820	1	
R1013	ERDS2TJ122	1.2K	1	
R1014	EVML3GA00B14	VARIABLE 10K	1	
R1015	ERDS2TJ153	15K	1	
R1016	ERDS2TJ153	15K	1	
R1017	ERDS2TJ562	5.6K	1	
R1018	ERDS2TJ561	560	1	
R1019	ERDS2TJ393	39K	1	
R1020	ERDS2TJ123	12K	1	
R1021	ERDS2TJ822	8.2K	1	
R1022	ERDS2TJ103	10K	1	
R1023,1024	ERDS2TJ154	150K	2	
R1025	EVML3GA00B14	VARIABLE 10K	1	
R2001	ERDS2TJ562	5.6K	1	
R2002	ERDS2TJ223	22K	1	
R2003	ERDS2TJ103	10K	1	
R2004	ERDS2TJ563	56K	1	
R2005	ERDS2TJ823	82K	1	
R2006	ERDS2TJ273	27K	1	
R2007,2008	ER0S2TKG2202	PRECISION METAL FILM 22K +-2%	2	
R2009	ERDS2TJ184	180K	1	
R2010,2011	ERDS2TJ332	3.3K	2	
R2012,2013	ERDS2TJ103	10K	2	
R2014	ERDS2TJ472	4.7K	1	
R2015	ERDS2TJ104	100K	1	
R2016-2018	ERDS2TJ154	150K	3	
R2019	ERDS2TJ333	33K	1	
R2020	ERDS2TJ124	120K	1	
R2021	ERDS2TJ563	56K	1	
R2022	ERDS2TJ560	56	1	
R2023,2024	ERDS2TJ222	2.2K	2	
R2025	ERDS2TJ123	12K	1	
R2026	ERDS2TJ563	56K	1	
R2027	ERDS2TJ224	220K	1	
R2028	ERDS2TJ334	330K	1	
R2029	ERDS2TJ822	8.2K	1	
R2030	ERDS2TJ103	10K	1	
R2031	ERDS2TJ563	56K	1	
R2032	ERDS2TJ334	330K	1	
R2033,2034	ERDS2TJ563	56K	2	
R2035	ERDS2TJ123	12K	1	
R2036	ERDS2TJ682	6.8K	1	
R2037	ERDS2TJ334	330K	1	
R2038	ERDS2TJ271	270	1	
R2039	ERDS2TJ154	150K	1	
R2040	ERDS2TJ474	470K	1	
R2041	ERDS2TJ683	68K	1	
R2042,2043	ERDS2TJ473	47K	2	
R2044	ERDS2TJ563	56K	1	
R2045	ERDS2TJ562	5.6K	1	
R2046	ERDS2TJ223	22K	1	
R2047	ERDS2TJ154	150K	1	
R2048	ERDS2TJ823	82K	1	
R2049,2050	ERDS2TJ103	10K	2	
R2053	ERDS2TJ564	560K	1	
R2054	ERDS2TJ821	820	1	
R2055	ERDS2TJ124	120K	1	
R2056	ERDS2TJ223	22K	1	
R2057	ERDS2TJ273	27K	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R2058	ERDS2TJ123	12K	1	
R2059	ERDS2TJ222	2.2K	1	
R2060	ERDS2TJ563	56K	1	
R2061	ERDS2TJ334	330K	1	
R2062	ERDS2TJ822	8.2K	1	
R2063	ERDS2TJ561	560	1	
R2064	ERDS2TJ332	3.3K	1	
R2065	EVML3GA00B15	VARIABLE 100K	1	
R2066	EVML3GA00B54	VARIABLE 50K	1	
R2067	EVML3GA00B23	VARIABLE 2K	1	
R2071	ERDS2TJ103	10K	1	
R2072	ERDS2TJ563	56K	1	
R2073	ERDS2TJ681	680	1	
		CAPACITORS		
C1001	ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C1002	ECCZ1H820J	CERAMIC 50V 82P +-5%	1	
	OR ECCZ1H820J6	CERAMIC 50V 82P +-5%		
C1003	ECKZ1H561KB	CERAMIC 50V 560P	1	
	OR ECKZ1H561KB6	CERAMIC 50V 560P		
C1004	ECKZ1H561KB	CERAMIC 50V 560P	1	
C1005	ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C1006	VCYSBDC473MX	CERAMIC 16V 0.047 +-20%	1	
C1007	ECKZ1H222KB	CERAMIC 50V 0.0022	1	
	OR ECKZ1H222KB6	CERAMIC 50V 0.0022		
C1008	ECKZ1H103ZV	CERAMIC 50V 0.01	1	
		+80%-20%		
C1009-1011	ECEA1EKK010	ELECTROLYTIC 25V 1	3	
C1012	ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1013	ECCZ1H181J	CERAMIC 50V 180P +-5%	1	
	OR ECCZ1H181J6	CERAMIC 50V 180P +-5%		
C1014	ECKZ1H102KB	CERAMIC 50V 0.001	1	
	OR ECKZ1H102KB6	CERAMIC 50V 0.001		
C1015	ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1016	ECEA0JK221X	ELECTROLYTIC 6.3V 220	1	
C1017	ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1018	ECKZ1H221KB	CERAMIC 50V 220P	1	
	OR ECKZ1H221KB6	CERAMIC 50V 220P		
C1019	ECKZ1H472ZF	CERAMIC 50V 0.0047	1	
	OR	+80%-20%		
	ECKZ1H472ZF6	CERAMIC 50V 0.0047		
		+80%-20%		
C1020	ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1021	ECEA1CK101X	ELECTROLYTIC 16V 100	1	
C1023-1027	ECEA1CK101X	ELECTROLYTIC 16V 100	5	
C2001	ECKZ1H472ZF	CERAMIC 50V 0.0047	1	
	OR	+80%-20%		
	ECKZ1H472ZF6	CERAMIC 50V 0.0047		
		+80%-20%		
C2002	ECKZ1H103ZV	CERAMIC 50V 0.01	1	
		+80%-20%		
C2003	ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C2004	ECEA0GKS470	ELECTROLYTIC 6.3V 47	1	
C2005	ECEA0GKS101	ELECTROLYTIC 6.3V 100	1	
C2006	ECEA1CKK100	ELECTROLYTIC 16V 10	1	
C2007	ECQB1H223KH	POLYESTER 50V 0.022	1	
C2008	ECEA0JKS220	ELECTROLYTIC 6.3V 22	1	
C2009	ECQB1H332KH	POLYESTER 50V 0.0033	1	
C2010	ECEA1EKK2R2	ELECTROLYTIC 25V 2.2	1	
C2011	ECEA1EKKR47	ELECTROLYTIC 25V 0.47	1	
C2012	ECEA1HSNR33	ELECTROLYTIC 50V 0.33	1	
C2013	ECQB1H123KH	POLYESTER 50V 0.012	1	
C2014	ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C2015	ECEA1EKK0R1	ELECTROLYTIC 25V 0.1	1	
C2016	ECEA1CKK100	ELECTROLYTIC 16V 10	1	
C2017	ECSF16ER27K	TANTALUM 16V 0.27	1	
C2018	ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C2019	ECQB1H272KH	POLYESTER 50V 0.0027	1	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
C2020		ECQB1H103KH	POLYESTER 50V 0.01	1	
C2021,2022		ECQV05473JZ	POLYESTER 50V 0.047 +-5%	2	
		OR ECQV1H473JZ	POLYESTER 50V 0.047 +-5%		
C2023		VCYD1E472KX	CERAMIC 25V 0.0047	1	
C2024		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C2025,2026		ECEAOJKS101	ELECTROLYTIC 6.3V 100	2	
C2028,2029		ECEAOJKS220	ELECTROLYTIC 6.3V 22	2	
C2031		ECQB1H562KH	POLYESTER 50V 0.0056	1	
C2032		ECSF16ER27K	TANTALUM 16V 0.27	1	
C2033		ECEA1CKK100	ELECTROLYTIC 16V 10	1	
C2034		ECKZ1H103ZV	CERAMIC 50V 0.01 +80%-20%	1	
C2035		ECEAOGKS470	ELECTROLYTIC 6.3V 4.7	1	
C2036,2037		ECEA1EKK010	ELECTROLYTIC 25V 1	2	
C2039		ECQB1H223KH	POLYESTER 50V 0.022	1	
C2040,2041		ECEA1EKK010	ELETROLYTIC 25V 1	2	
C2042		ECQB1H332KH	POLYESTER 50V 0.0033	1	
C2043		ECQB1H682KH	POLYESTER 50V 0.0068	1	
C2044		ECQB1H103KH	POLYESTER 50V 0.01	1	
C2045,2046		VCYSBDC333MX	CERAMIC 16V 0.033 +-20%	2	
C2047		VCYSBDC473MX	CERAMIC 16V 0.047 +-20%	1	
C2048		ECEA1CU102	ELECTROLYTIC 16V 1000	1	
C2050		ECKZ1H102KB	CERAMIC 50V 0.001	1	
		OR ECKZ1H102KB6	CERAMIC 50V 0.001		
			COILS		
L1001		ELC08D003	50	1	
		OR VLQ0128	50		
L1002		ELC08D002	300	1	
		OR VLQ0129	300		
L1003		ELC08D003	50	1	
		OR VLQ0128	50		
L1004		ELC08D002	300	1	
		OR VLQ0129	300		
L1005		ELC08D003	50	1	
		OR VLQ0128	50		
L1006-1009		ELC08D002	300	4	
		OR VLQ0129	300		
			CRYSTAL OSCILLATOR		
X1001		EFOA815K04G4		1	
			PIN HEADERS		
P24		VJPS0145	18P	1	
P25,26		VJPS0146	20P	2	
P28		VJPS0073	3P	1	
			MISCELLANEOUS		
		VMKS0062	PEG PIECE	1	
		VSCS0424	SHIELD CASE	1	
			LUMINANCE/CHROMINANCE/AUDIO C.B.A		
			INTEGRATED CIRCUITS		
IC3001		VEFSY006		1	
IC3002		VCRS0032		1	
IC3003		VCRS0033		1	
IC3004		AN3310K		1	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
IC4001		VCRS0025		1	
IC4002		VCRS0024		1	
IC4003		VCRS0025		1	
IC4004		VCRS0024		1	
IC8001		VEFSC008		1	
			TRANSISTORS		
Q3001		DTA124A		1	
		OR UN1112			
Q3002		2SD636(Q,R,S)		1	
Q3003		2SB641(Q,R,S)		1	
Q3004		2SC2377(C,D)		1	
Q3005		DTC124A		1	
		OR UN1212			
Q3006		DTA124A		1	
		OR UN1112			
Q3007		2SD636(S)		1	
Q3008		DTC124A		1	
		OR UN1212			
Q3009		DTC144A		1	
		OR UN1213			
Q4001		2SD636(R,S)		1	
Q4002	⚠	2SD637(Q,R,S)		1	
Q8001		2SB641(Q,R,S)		1	
Q8002		2SD636(Q,R,S)		1	
			DIODES		
D3001,3002		MA165		2	
		OR 1SS119			
			RESISITORS		
R3001		EVML3GA00B23	VARIABLE 2K	1	
R3002		ERDS2TJ153	15K	1	
R3004		ERDS2TJ332	3.3K	1	
R3005		ERDS2TJ223	22K	1	
R3006		ERDS2TJ822	8.2K	1	
R3007		ERDS2TJ102	1K	1	
R3008		ERDS2TJ221	220	1	
R3009		ERDS2TJ152	1.5K	1	
R3010,3011		ERDS2TJ821	820	2	
R3012		ERDS2TJ152	1.5K	1	
R3013		ERDS2TJ222	2.2K	1	
R3014,3015		ERDS2TJ102	1K	2	
R3016		ERDS2TJ393	39K	1	
R3018		ERDS2TJ681	680	1	
R3019		ERDS2TJ271	270	1	
R3020		ERDS2TJ563	56K	1	
R3021		ERDS2TJ182	1.8K	1	
R3023		ERDS2TJ561	560	1	
R3024		ERDS2TJ103	10K	1	
R3025		ERDS2TJ105	1M	1	
R3026		ERDS2TJ684	680K	1	
R3027		ERDS2TJ683	68K	1	
R3028		ERDS2TJ153	15K	1	
R3029		ERDS2TJ101	100	1	
R4001		ERDS2TJ101	100	1	
R4002		ERDS2TJ331	330	1	
R4003		ERDS2TJ181	180	1	
R4004		EVML3GA00B54	VARIABLE 50K	1	
R4005		ERDS2TJ333	33K	1	
R4006,4007		ERDS2TJ271	270	2	
R4008		EVML3GA00B24	VARIABLE 20K	1	
R4009		ERDS2TJ152	1.5K	1	
R4021		ERDS2TJ101	100	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R4022	ERDS2TJ331	330	1	
R4023	ERDS2TJ181	180	1	
R4024	EVML3GA00B54	VARIABLE 50K	1	
R4025	ERDS2TJ333	33K	1	
R4026,4027	ERDS2TJ271	270	2	
R4028	EVML3GA00B24	VARIABLE 20K	1	
R4029	ERDS2TJ152	1.5K	1	
R4051	ERDS2TJ222	2.2K	1	
R4052	ERDS2TJ223	22K	1	
R4053	ERDS2TJ331	330	1	
R8001	ERDS2TJ122	1.2K	1	
R8002	ERDS2TJ271	270	1	
R8003	ERDS2TJ102	1K	1	
R8004	ERDS2TJ681	680	1	
R8005	ERDS2TJ102	1K	1	
R8006	ERDS2TJ222	2.2K	1	
R8007	ERDS2TJ470	47	1	
R8008	ERDS2TJ122	1.2K	1	
R8009	ERDS2TJ181	180	1	
R8010,8011	ERDS2TJ102	1K	2	
R8012	ERDS2TJ681	680	1	
R8013	ERDS2TJ821	820	1	
R8014	ERDS2TJ561	560	1	
R8015	ERDS2TJ273	27K	1	
		CAPACITORS		
C3001	ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C3002	ECKZ1H221KB	CERAMIC 50V 220P	1	
	OR ECKZ1H221KB6	CERAMIC 50V 220P		
C3003	ECEA0JK221	ELECTROLYTIC 6.3V 220	1	
C3005	VCYSBDC104MX	CERAMIC 16V 0.1 +-20%	1	
C3006	ECEA1HK010	ELECTROLYTIC 50V 1	1	
C3007	ECCZ1H820JC	CERAMIC 50V 82P +-5%	1	
	OR ECCZ1H820JC6	CERAMIC 50V 82P +-5%		
C3008	ECKZ1H471KB	CERAMIC 50V 470P	1	
	OR ECKZ1H471KB6	CERAMIC 50V 470P		
C3009	ECEA1CK100	ELECTROLYTIC 16V 10	1	
C3010,3011	VCYSBDC104MX	CERAMIC 16V 0.1 +-20%	2	
C3013	ECCZ1H820JC	CERAMIC 50V 82P +-5%	1	
	OR ECCZ1H820JC6	CERAMIC 50V 82P +-5%		
C3014	VCYSBDC103MX	CERAMIC 16V 0.01 +-20%	1	
C3015	ECCZ1H820JC	CERAMIC 50V 82P +-5%	1	
	OR ECCZ1H820JC6	CERAMIC 50V 82P +-5%		
C3016	VCYSBDC103MX	CERAMIC 16V 0.01 +-20%	1	
C3017,3018	ECEA1CKS100	ELECTROLYTIC 16V 10	2	
C3019	ECCZ1H560JC6	CERAMIC 50V 56P +-5%	1	
C3020	VCYSBDC103MX	CERAMIC 16V 0.01 +-20%	1	
C3021	ECCZ1H560JC6	CERAMIC 50V 56P +-5%	1	
C3022-3024	VCYSBDC103MX	CERAMIC 16V 0.01 +-20%	3	
C3025	ECCZ1H220JC	CERAMIC 50V 22P +-5%	1	
	OR ECCZ1H220JC6	CERAMIC 50V 22P +-5%		
C3027	ECEA1HKS010	ELECTROLYTIC 50V 1	1	
C3029	ECKZ1H681KB	CERAMIC 50V 680P	1	
	OR ECKZ1H681KB6	CERAMIC 50V 680P		
C3030	ECCZ1H820J	CERAMIC 50V 82P +-5%	1	
	OR ECCZ1H820J6	CERAMIC 50V 82P +-5%		
C3031	ECEA0JK470	ELECTROLYTIC 6.3V 47	1	
C3032	ECEA1HK2R2	ELECTROLYTIC 50V 2.2	1	
C3033	ECEA1EK3R3	ELECTROLYTIC 25V 3.3	1	
C3034	ECEA1EK4R7	ELECTROLYTIC 25V 4.7	1	
C3035	ECEA1EK3R3	ELECTROLYTIC 25V 3.3	1	
C3036	VCYSBDC104MX	CERAMIC 16V 0.1 +-20%	1	
C3038	ECEA0JK220	ELECTROLYTIC 6.3V 22	1	
C3039	ECCZ1H151J	CERAMIC 50V 150P +-5%	1	
	OR ECCZ1H151J6	CERAMIC 50V 150P +-5%		
C3040	ECEA1EK3R3	ELECTROLYTIC 25V 3.3	1	
C3041	ECEA1AK220	ELECTROLYTIC 10V 22	1	
C3043	ECEA1AKS330	ELECTROLYTIC 10V 33	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C3044	ECEA1AK330	ELECTROLYTIC 10V 33	1	
C3045,3046	ECEA0JK221X	ELECTROLYTIC 6.3V 220	2	
C3047	ECEA0JK220	ELECTROLYTIC 6.3V 22	1	
C3048,3049	ECEA1CKS100	ELECTROLYTIC 16V 10	2	
C3050	ECCZ1H470JC6	CERAMIC 50V 47P +-5%	1	
C3051	ECKZ1H102KB	CERAMIC 50V 0.001	1	
	OR ECKZ1H102KB6	CERAMIC 50V 0.001		
C3052	VCYSBDC104MX	CERAMIC 16V 0.1 +-20%	1	
C3054	ECEA0JK470	ELECTROLYTIC 6.3V 47	1	
C4001	ECSF1VE105	TANTALUM 35V 1	1	
C4002	ECSF1CD334KD	TANTALUM 16V 0.33	1	
C4003	ECSF1CD224KD	TANTALUM 16V 0.22	1	
C4004	ECEA0JKS220	ELECTROLYTIC 6.3V 22	1	
C4005,4006	ECEA1CKS100	ELECTROLYTIC 16V 10	2	
C4007	ECEA1EKS4R7	ELECTROLYTIC 25V 4.7	1	
C4008	ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C4009	ECEA1CKS220	ELECTROLYTIC 16V 22	1	
C4010	ECEA0JKS220	ELECTROLYTIC 6.3V 22	1	
C4011	ECQV1H563JZ	POLYESTER 50V 0.056 +-5%	1	
C4012,4013	ECEA0JKS330	ELECTROLYTIC 6.3V 33	2	
C4014,4015	ECSF1CD104KD	TANTALUM 16V 0.1	2	
C4016	ECSF1CD334KD	TANTALUM 16V 0.33	1	
C4021	ECSF1VE105	TANTALUM 35V 1	1	
C4022	ECSF1CD334KD	TANTALUM 16V 0.33	1	
C4023	ECSF1CD224KD	TANTALUM 16V 0.22	1	
C4024	ECEA0JKS220	ELECTROLYTIC 6.3V 22	1	
C4025,4026	ECEA1CKS100	ELECTROLYTIC 16V 10	2	
C4027	ECEA1EKS4R7	ELECTROLYTIC 25V 4.7	1	
C4028	ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C4029	ECEA1CKS220	ELECTROLYTIC 16V 22	1	
C4030	ECEA0JKS220	ELECTROLYTIC 6.3V 22	1	
C4031	ECQV1H563JZ	POLYESTER 50V 0.056 +-5%	1	
C4032,4033	ECEA0JKS330	ELECTROLYTIC 6.3V 33	2	
C4034,4035	ECSF1CD104KD	TANTALUM 16V 0.1	2	
C4036	ECSF1CD334KD	TANTALUM 16V 0.33	1	
C4051	ECEA1CK101	ELECTROLYTIC 16V 100	1	
C4052	ECEA1CKS330	ELECTROLYTIC 16V 33	1	
C4053	ECQB1H223KH	POLYESTER 50V 0.022	1	
C4054	ECKF1H103ZV6	CERAMIC 50V 0.01 +80%-20%	1	
C4055,4056	ECV1ZW60X64	TRIMMER 60P	2	
	OR TCV1ZW60X64	TRIMMER 60P		
	OR VCVSAW60X1B	TRIMMER 60P		
C4057	ECQP1152JZ	POLYESTER 100V 0.0015 +-5%	1	
C4058	ECEA1EKKR22	ELECTROLYTIC 25V 0.22	1	
C8001	ECKZ1H222KB	CERAMIC 50V 0.0022	1	
	OR ECKZ1H222KB6	CERAMIC 50V 0.0022		
C8002	ECEA1EK3R3	ELECTROLYTIC 25V 3.3	1	
C8003	ECCZ1H220JC	CERAMIC 50V 22P +-5%	1	
	OR ECCZ1H220JC6	CERAMIC 50V 22P +-5%		
C8004	ECEA1HKS010	ELECTROLYTIC 50V 1	1	
C8005	ECKZ1H102KB	CERAMIC 50V 0.001	1	
	OR ECKZ1H102KB6	CERAMIC 50V 0.001		
C8006	ECEA0JK470	ELECTROLYTIC 6.3V 47	1	
C8007	ECCZ1H050CC6	CERAMIC 50V 5P +-25PF	1	
C8008	ECEA0JK470	ELECTROLYTIC 6.3V 47	1	
C8009	ECEA0JKS101	ELECTROLYTIC 6.3V 100	1	
C8010	VCYSBDC103MX	CERAMIC 16V 0.01 +-20%	1	
C8011	ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C8012	ECEA1HK010	ELECTROLYTIC 50V 1	1	
C8013	VCYSBDC103MX	CERAMIC 16V 0.01 +-20%	1	
C8014	ECCZ1H101J	CERAMIC 50V 100P +-5%	1	
	OR ECCZ1H101J6	CERAMIC 50V 100P +-5%		
C8015,8016	ECCZ1H180JC	CERAMIC 50V 18P +-5%	2	
	OR ECCZ1H180JC6	CERAMIC 50V 18P +-5%		
		DELAY LINE		
DL3001	VLD0059		1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		FILTERS		
FL3001	VLFS0009		1	
FL4001,4002	VLFS0002		2	
FL8001	VLF0320		1	
FL8002	VLF0297		1	
		COILS		
L3001	VLQEL05R101K	100	1	
L3002,3003	VLQEL05R150K	15	2	
L3005	VLQEL05R121K	120	1	
L3006	VLQEL05R680K	68	1	
L3007	VLQEL05R101K	100	1	
L3008	VLQEL05F820K	82	1	
L3009	VLQEL05R101K	100	1	
L3010	VLQEL05F330K	33	1	
L3011	VLQEL05R270K	27	1	
L3013	VLQEL05F101K	100	1	
L3014	VLQEL05F220K	22	1	
L3015	VLQEL05R221K	220	1	
L3016,3017	VLQEL05R270K	27	2	
L4001	VLQ0093		1	
L4002	VLQS67F222K	2.2M	1	
L4003	VLQ0093		1	
L4004	VLQS67F222K	2.2M	1	
L4005	VLQEL05R471K	470	1	
L8001	VLQEL05F470K	47	1	
L8002,8003	VLQEL05F101K	100	2	
L8004	VLQEL05F680K	68	1	
L8005	VLQEL05F330K	33	1	
		CRYSTAL OSCILLATOR		
X8001	VSXS0006		1	
		PIN HEADERS		
P20	VJPS0145	18P	1	
P21	VJPS0144	18P	1	
P22,23	VJPS0077	8P	2	
		TRANSFORMER		
T4001	EIQ7QF004B		1	
	OR VLTS0040			
		PRINTED CIRCUIT BOARD ASSEMBLY		
	VEPS0420A	DOLBY C.B.A	1	
		MISCELLANEOUS		
	T18S	FASTENER	1	
	VMZS0107	HEAD AMP P.C.B BARPIER	1	
	VSCS0421	SHIELD CASE	1	
	VSCS0422	SHIELD CASE	1	
	VSCS0423	SHIELD CASE	1	
	VSCS0453	SHIELD PLATE	1	
	VSCS0473	SHIELD CAP	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		SYSTEM CONTROL C.B.A		
		INTEGRATED CIRCUITS		
IC6001	UPD7503G-186		1	
IC6002	MN1534VGA		1	
IC6003	MN6283		1	
IC6004	BA6209U3		1	
IC6005	VCRS0035		1	
IC6006	VCRS0034		1	
		TRANSISTORS		
Q6001,6002	2SD636(Q,R,S)		2	
Q6003	2SD637(Q,R,S)		1	
Q6004	2SD636(Q,R,S)		1	
Q6005	2SD1051(P,Q,R)		1	
Q6006	DTA124A		1	
	OR UN1112			
Q6007	2SC2594		1	
Q6008	DTA114A		1	
	OR UN1111			
Q6009	2SD637(Q,R,S)		1	
Q6010	2SD636(Q,R,S)		1	
Q6011	2SB641(Q,R,S)		1	
Q6012	2SB819AU(Q,R)		1	
Q6013	2SD636(Q,R,S)		1	
Q6014	DTA124A		1	
	OR UN1112			
Q6015	DTC144A		1	
	OR UN1213			
Q6016	2SD973(Q,R,S)		1	
Q6017	DTA124A		1	
	OR UN1112			
Q6018	DTC114A		1	
	OR UN1211			
Q6019	2SB894(Q,R)		1	
		DIODES		
D6001-6004	MA154WA		1	
D6005-6009	MA165		1	
	OR 1SS119			
D6010	EM1Z		1	
	OR ERB12-01			
	OR ERB12-02			
D6011	MA165		1	
	OR 1SS119			
D6012	EM1Z		1	
	OR ERB12-01			
	OR ERB12-02			
D6013,6014	MA165		1	
	OR 1SS119			
D6015	EM1Z		1	
	OR ERB12-01			
	OR ERB12-02			
D6020	MA154WA		1	
D6022-6024	MA165		1	
	OR 1SS119			
D6025	EK04		1	
	OR ERA81-004			
	OR S1S04			

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
			RESISTORS		
R6001		ERDS2TJ222	2.2K	1	
R6002,6003		ERDS2TJ473	47K	2	
R6004		ERDS2TJ390	39	1	
R6005		ERDS2TJ222	2.2K	1	
R6006,6007		ERDS2TJ104	100K	2	
R6008,6009		ERDS2TJ103	10K	2	
R6010		ERDS2TJ562	5.6K	1	
R6011-6014		ERDS2TJ103	10K	4	
R6015-6017		ERDS2TKG1502	PRECISION METAL FILM 15K +-2%	3	
R6018		ERDS2TKG3302	PRECISION METAL FILM 33K +-2%	1	
R6019-6022		ERDS2TJ223	22K	4	
R6023		ERDS2TJ101	100	1	
R6024-6027		ERDS2TJ104	100K	4	
R6028		ERDS2TJ103	10K	1	
R6029		ERDS2TJ562	5.6K	1	
R6030		ERDS2TJ103	10K	1	
R6031,6032		ERDS2TJ104	100K	2	
R6033,6034		ERDS2TJ563	56K	2	
R6035		ERDS2TJ103	10K	1	
R6036		ERDS2TJ223	22K	1	
R6037		ERDS2TJ103	10K	1	
R6038,6039		ERDS2TJ271	270	2	
R6040,6041		ERDS2TJ332	3.3K	2	
R6042		ERDS2TJ221	220	1	
R6043		ERDS2TJ474	470K	1	
R6044		ERDS2TJ184	180K	1	
R6045		ERDS2TJ273	27K	1	
R6046,6047		ERDS2TJ153	15K	2	
R6048		ERDS2TJ563	56K	1	
R6049		EVML3GA00B14	VARIABLE 10K	1	
R6050		ERDS2TJ273	27K	1	
R6051		ERDS2TJ101	100	1	
R6052		ERDS2TJ561	560	1	
R6053		ERDS2TJ823	82K	1	
R6054		ERDS2TJ102	1K	1	
R6055		ERDS2TJ563	56K	1	
R6056		ERDS2TJ222	2.2K	1	
R6057		ERDS2TJ474	470K	1	
R6058		ERDS2TJ224	220K	1	
R6059		ERDS2TJ184	180K	1	
R6060		ERDS2TJ222	2.2K	1	
R6061		ERDS2TJ223	22K	1	
R6062		ERDS2TJ273	27K	1	
R6063		ERDS2TJ184	180K	1	
R6065		ERDS2TJ333	33K	1	
R6066		ERDS2TJ221	220	1	
R6067		ERDS2TJ103	10K	1	
R6068		ERDS2TJ102	1K	1	
R6069		ERDS2TJ473	47K	1	
R6070		ERDS2TJ104	100K	1	
R6071	⚠	ERG1SJ121	METAL OXIDE 1W 120	1	
	⚠	OR XRG1SJ121	METAL OXIDE 1W 120		
R6072		EVLDJAT08B15	VARIABLE 100K	1	
R6073		EVLDKAT08B15	VARIABLE 100K	1	
R6074		ERDS2TJ560	56	1	
R6075		ERDS2TJ270	27	1	
R6076	⚠	ERDS2TJ100	10	1	
R6077		ERDS2TJ101	100	1	
R6078,6079		ERDS2TJ223	22K	2	
R6080		ERDS2TJ101	100	1	
R6081		ERDS2TJ270	27	1	
R6082	⚠	ERDS2TJ100	10	1	
R6083		ERDS2TJ102	1K	1	
R6084		ERDS2TJ332	3.3K	1	
R6085		ERDS2TJ473	47K	1	
R6086		ERDS2TJ101	100	1	
R6087,6088		ERDS2TJ102	1K	2	
R6089		ERDS2TJ223	22K	1	
R6090		ERDS2TJ103	10K	1	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
R6091		ERDS2TJ270	27	1	
			CAPACITORS		
C6001		ECCZ1H330JC	CERAMIC 50V 33P +-5%	1	
		OR ECCZ1H330JC6	CERAMIC 50V 33P +-5%		
C6002		ECCZ1H100DC	CERAMIC 50V 10P +-0.5PF	1	
		OR ECCZ1H100DC6	CERAMIC 50V 10P +-0.5PF		
C6003		ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C6004		ECKZ1H103ZV	CERAMIC 50V 0.01	1	
			+80%-20%		
C6005		ECEA0JKS470	ELECTROLYTIC 6.3V 47	1	
C6006-6010		ECKZ1H103ZV	CERAMIC 50V 0.01	5	
			+80%-20%		
C6011		ECEA0JKS220	ELECTROLYTIC 6.3V 22	1	
C6012		ECEA1CKS100	ELECTROLYTIC 16V 10	1	
C6013		ECKZ1H102KB	CERAMIC 50V 0.001	1	
		OR ECKZ1H102KB6	CERAMIC 50V 0.001		
C6014		ECEA1CSN100	ELECTROLYTIC 16V 10	1	
C6015		ECEA1HKS010	ELECTROLYTIC 50V 1	1	
C6016		ECEA1HKSR33	ELECTROLYTIC 50V 0.33	1	
C6017		ECEA1EKS4R7	ELECTROLYTIC 25V 4.7	1	
C6018		ECEA1HKS010	ELECTROLYTIC 50V 1	1	
C6019		ECEA1CKS100	ELECTROLYTIC 16V 10	1	
C6020		ECKZ1H103ZV	CERAMIC 50V 0.01	1	
			+80%-20%		
C6021		ECEA1CKS100	ELECTROLYTIC 16V 10	1	
C6022-6024		ECKZ1H103ZV	CERAMIC 50V 0.01	3	
			+80%-20%		
C6025		ECEA1HKS2R2	ELECTROLYTIC 50V 2.2	1	
C6026,6027		ECKZ1H102KB	CERAMIC 50V 0.001	2	
		OR ECKZ1H102KB6	CERAMIC 50V 0.001		
C6028		ECKZ1H103ZV	CERAMIC 50V 0.01	1	
			+80%-20%		
C6029		ECEA0JKS101	ELECTROLYTIC 6.3V 100	1	
C6030		ECKZ1H103ZV	CERAMIC 50V 0.01	1	
			+80%-20%		
C6031		ECEA1AKS330	ELECTROLYTIC 10V 33	1	
C6032		ECEA1HKSR47	ELECTROLYTIC 50V 0.47	1	
C6033		ECKZ1H103ZV	CERAMIC 50V 0.01	1	
			+80%-20%		
			COIL		
L6001		VLQEL05F101K	100	1	
			CRYSTAL OSCILLATOR		
X6001		VSX0086		1	
			PIN HEADERS		
P29,30		VJSS0150	FLEXIBLE 30P	2	
P31		VJSS0149	FLEXIBLE 15P	1	
P32		VJPS0082	4P	1	
P34		VJPS0082	4P	1	
			SWITCHES		
SW6001,6002		ESD14304	SELECT	2	
SW6003		ESD14519	SELECT	1	
SW6004		EMR2521	POWER	1	
SW6005-6007		EVQQSR05K	PUSH	3	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
			FUSE		
F6001	⚠	XBA1C25NU100	2.5A	1	
			MISCELLANEOUS		
		EDD073K23A3	LIQUID CRYSTAL DISPLAY COUNTER	1	
		LNO408CP3	BACK LIGHT	1	
		VEKS1473	LIQUID CRYSTAL DISPLAY COUNTER	1	
			ASS'Y		
		VJF0190	FUSE HOLDER	2	
		VMDS0232	COUNTER HOLDER -TOP	1	
		VMDS0233	COUNTER HOLDER -BOTTOM	1	
		VSQS0212	CONDUCTIVE RUBBER	1	
			DOLBY C.B.A		
			INTEGRATED CIRCUITS		
IC4101		HA12045MP		1	
			RESISTORS		
R4101		ERDS2EJ104	100K	1	
		OR ERDS2TJ104	100K		
R4102		ERDS2EJ682	6.8K	1	
		OR ERDS2TJ682	6.8K		
R4103		ERDS2EJ473	47K	1	
		OR ERDS2TJ473	47K		
R4104		ERDS2EJ330	33	1	
		OR ERDS2TJ330	33		
R4105		ERDS2EJ332	3.3K	1	
		OR ERDS2TJ332	3.3K		
R4106,4107		ERDS2EJ272	2.7K	2	
		OR ERDS2TJ272	2.7K		
R4108		ERDS2EJ332	3.3K	1	
		OR ERDS2TJ332	3.3K		
R4109		ERDS2EJ103	10K	1	
		OR ERDS2TJ103	10K		
R4110		ERDS2EJ330	33	1	
		OR ERDS2TJ330	33		
R4111		ERDS2EJ473	47K	1	
		OR ERDS2TJ473	47K		
R4112		ERDS2EJ682	6.8K	1	
		OR ERDS2TJ682	6.8K		
R4113		ERDS2EJ104	100K	1	
		OR ERDS2TJ104	100K		
			CAPACITORS		
C4101		ECEA1CSN100	ELECTROLYTIC 16V 10	1	
C4102		ECSF1CD684KD	TANTALUM 16V 0.68	1	
C4103		ECSF1CD224KD	TANTALUM 16V 0.22	1	
C4104		ECQV1H183JZ	POLYESTER 50V 0.018 +-5%	1	
C4105		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C4106		ECSF0JD475D	TANTALUM 6.3V 4.7	1	
		OR ECSF0JE475D	TANTALUM 6.3V 4.7		
C4107		ECQB1H472JH	POLYESTER 50V 0.0047 +-5%	1	
C4108		ECQV1H333JZ	POLYESTER 50V 0.033 +-5%	1	
C4109		ECQV1H473JZ	POLYESTER 50V 0.047 +-5%	1	
C4110		ECEA1CSN100	ELECTROLYTIC 16V 10	1	
C4111		ECEA0JK221X	ELECTROLYTIC 6.3V 220	1	
C4112,4113		ECEA1CSN100	ELECTROLYTIC 16V 10	2	
C4114		ECEA1CKK100	ELECTROLYTIC 16V 10	1	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
C4115		ECQV1H473JZ	POLYESTER 50V 0.047 +-5%	1	
C4116		ECEA1CSN100	ELECTROLYTIC 16V 10	1	
C4117		ECSF0JD475D	TANTALUM 6.3V 4.7	1	
		OR ECSF0JE475D	TANTALUM 6.3V 4.7		
C4118		ECQB1H472JH	POLYESTER 50V 0.0047 +-5%	1	
C4119		ECQV1H333JZ	POLYESTER 50V 0.033 +-5%	1	
C4120		ECQV1H183JZ	POLYESTER 50V 0.018 +-5%	1	
C4121		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C4122		ECSF1CD224KD	TANTALUM 16V 0.22	1	
C4123		ECSF1CD684KD	TANTALUM 16V 0.68	1	
C4124		ECEA1CKS470	ELECTROLYTIC 16V 47	1	
C4125		ECEA1CSN100	ELECTROLYTIC 16V 10	1	
			COIL		
L4101		VLQEL05F391K	390	1	
			MISCELLANEOUS		
		VJHS0063	PACK LEAD PIN	1	
		VJHS0064	PACK LEAD PIN	1	
			FULL ERASE HEAD C.B.A		
			TRANSISTOR		
Q4553		2SD603		1	
			RESISTOR		
R4553		ERDS2TJ333	33K	1	
			CAPACITORS		
C4551		ECEA1CK100	ELECTROLYTIC 16V 10	1	
C4555		VCYSBDC153MX	CERAMIC 16V 0.015 +-20%	1	
C4556		ECKZ1H472ZF	CERAMIC 50V 0.0047	1	
		OR	+80%-20%		
		ECKZ1H472ZF6	CERAMIC 50V 0.0047		
			+80%-20%		
C4557		VCYD1H333KX	CERAMIC 50V 0.033	1	
			COIL		
L4551		VLQSA04R101K	100	1	
			TRANSFORMER		
T4551		ELM7Q011E		1	
			ELECTRICAL PARTS		
			LOCATED ON CHASSIS		
		ENC-16801	RF CONVERTOR	1	
		VEKS1449	CAMERA JACK ASS'Y	1	
		VEKS1453	MULTIPULL JACK ASS'Y	1	
		VEKS1812	LUG ASS'Y	1	
		VEQS0256	RF CONVERTOR	1	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
		VHNS0026	PLASTIC STOPPER	2	
		VJBS00280	PHOTO SENSOR P.C.B	1	
		VJBS00299	REMOTE JACK P.C.B	1	
		VJBS00303	MAIN BRAKE SOLENOID P.C.B	1	
		VJES0006	TERMINAL	32	
		VJJS0061	REMOTE JACK	1	
		VSCS0421	SHIELD CASE	1	
		VXAS0602	TAKEUP PHOTO TR UNIT	1	
		VXAS0603	SUPPLY PHOTO TR UNIT	1	
		VXKS0347	SENSOR LED UNIT	1	
		XTNV14+45Z	TAPPING SCREW 1.4X4.5	7	
		XTNV14+7Z	TAPPING SCREW 1.4X7	1	
IC1551		ON1301	INTEGRATED CIRCUIT	1	
D1552-1554		MA4075	DIODE ZENER	3	
R1551,1552		ERDS2TJ100	RESISTOR CARBON 1/4W 10	2	
SW1551		VSH0023	SAFETY TAB SWITCH	1	
SW1552		VSS0099	MODE SELECT SWITCH	1	
		MU16VPB3	WIRED TRANSMITTER C.B.A		
			INTEGRATED CIRCUITS		
IC1		MN1453AWR		1	
			DIODE		
D16		OA90G		1	
			RESISTORS		
R13		ERD25TJ681	1/4W 680	1	
VR1		EVNB4A00B53	VARIABLE 5K	1	
			CAPACITORS		
C1		ECEA1CK470	ELECTROLYTIC 16V 47	1	
C2		ECEA1HK2R2	ELECTROLYTIC 50V 2.2	1	
C3		ECCF1H390JU	CERAMIC 50V 39P +-5%	1	
C4		ECKF1H221KB	CERAMIC 50V 220P	1	

ORDER NO. VRD-8409-301
B3

Service Manual

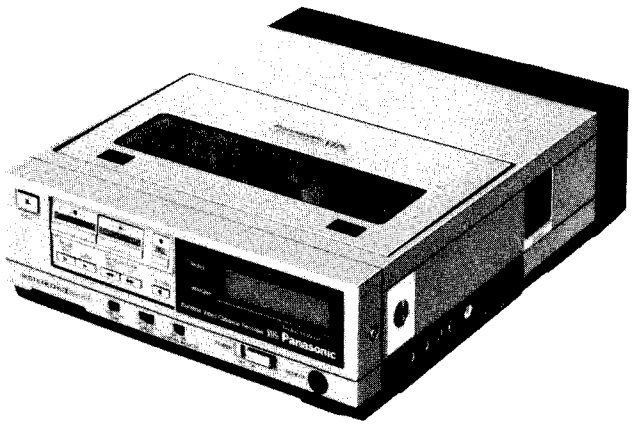
VHS Video Cassette Recorder

PV-8000

Supplementary

Subject: New Servo/A.V.R. Circuit

Since the Servo/A.V.R. C.B.A. has been redesigned, use this supplementary service manual when servicing the unit with new Servo/A.V.R. C.B.A.



"Ⓐ"

Identification: A label with Ⓐ on it is put on the rear side of decks with new C.B.A.

Introduction: New Servo/A.V.R. C.B.A. has been introduced from Serial No. I4SA56701 (Effective date Sept. 27, 1984) in common with old C.B.A.

NOTE:
This supplementary service manual contains information about how the new Servo/A.V.R. C.B.A. differs from the original Servo/A.V.R. C.B.A. in service manual (model PV-8000/ORDER NO. VRD-8403-507). Please refer to original one for all information pertaining to the PV-8000 that is not covered in this supplementary service manua

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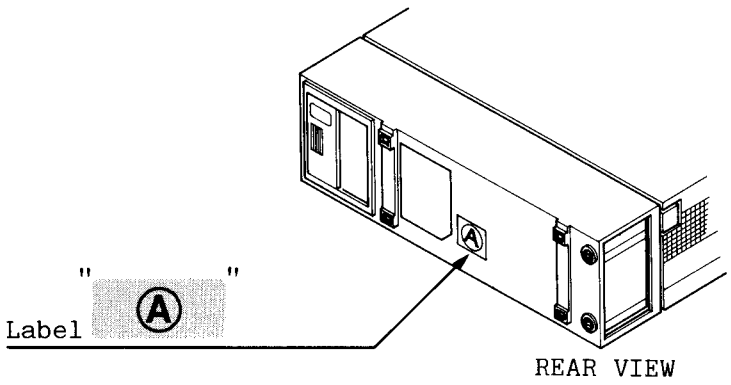
ELECTRICAL REPLACEMENT PARTS LIST 6

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are shaded on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

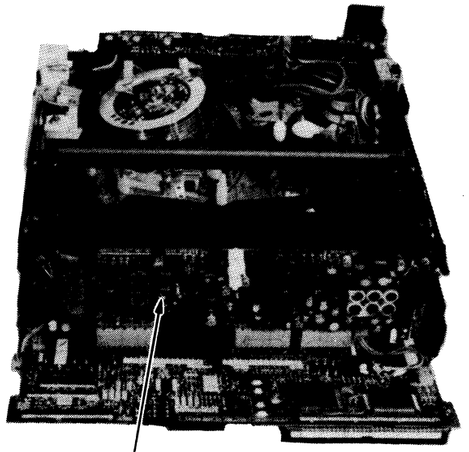
NOTE:
Location of label " Ⓐ " .



ELECTRICAL ADJUSTMENT PROCEDURES

2. ADJUSTMENT PROCEDURES

2-3. SERVO SECTION



Location of Test Points & Adjustment Points

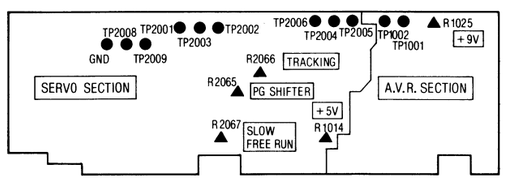


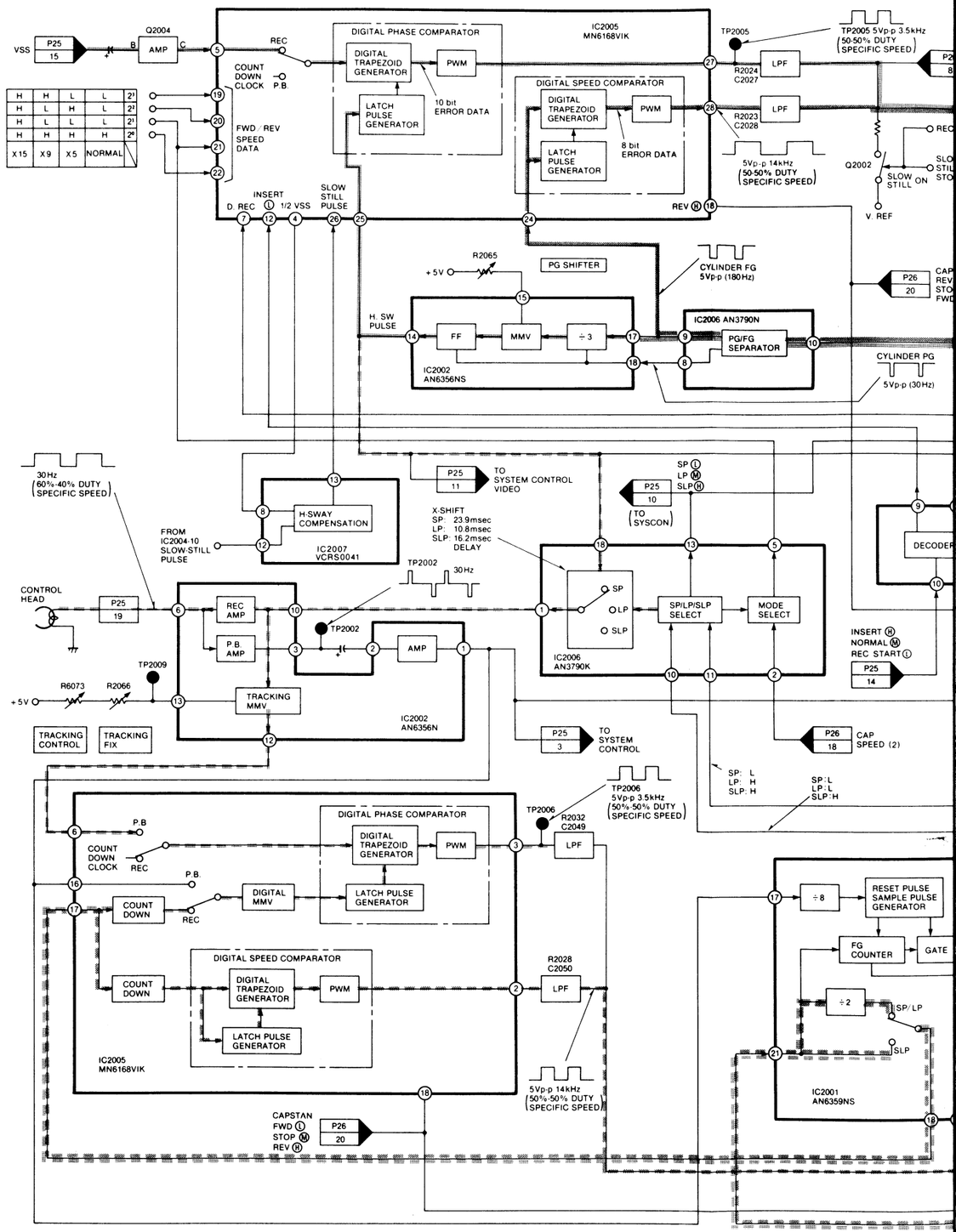
Fig. E1

2-3-3. SLOW FREE RUN ADJUSTMENT

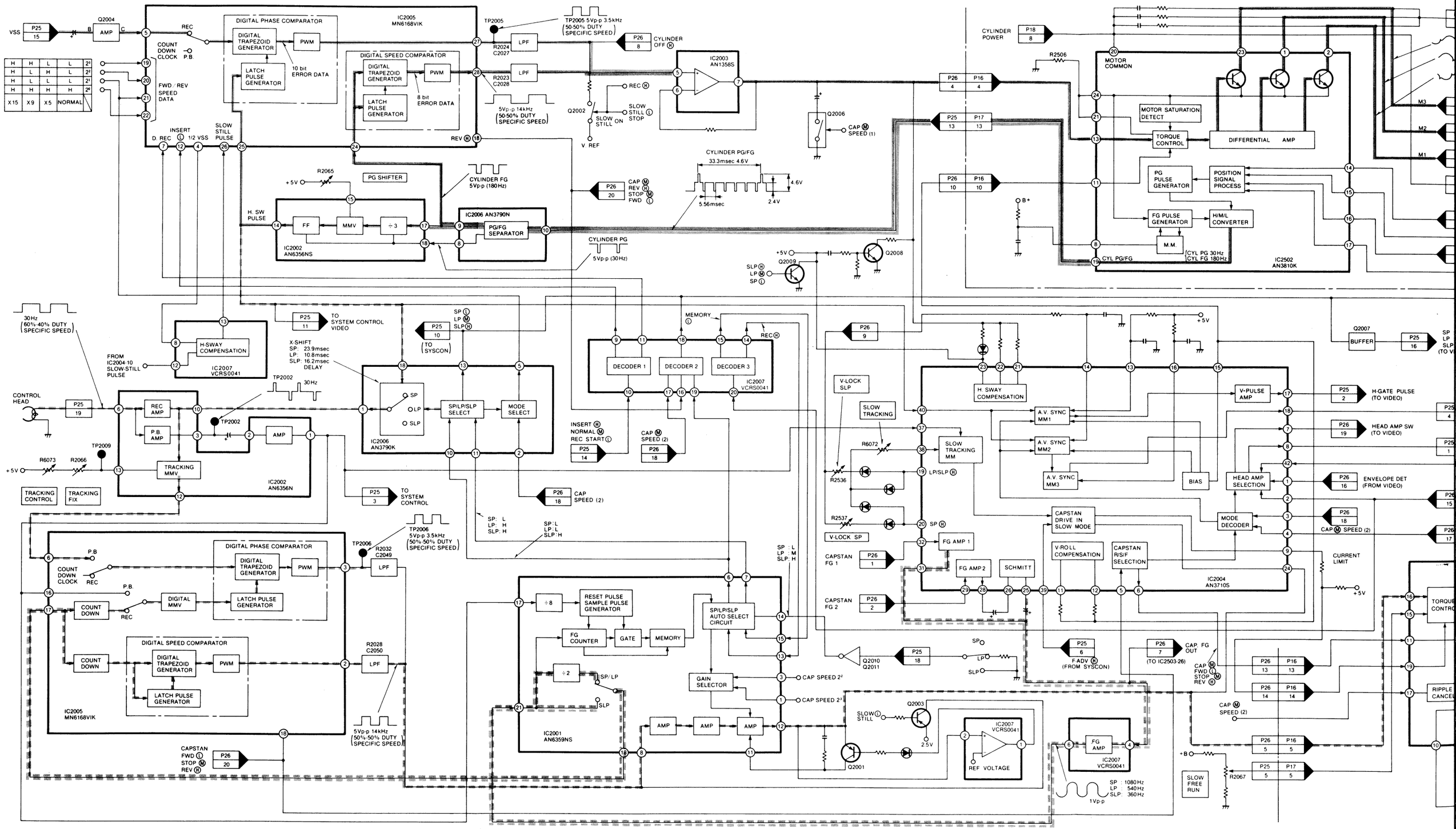
Test Point: TP2001
Adjustment: R2067 (SLOW-FR)

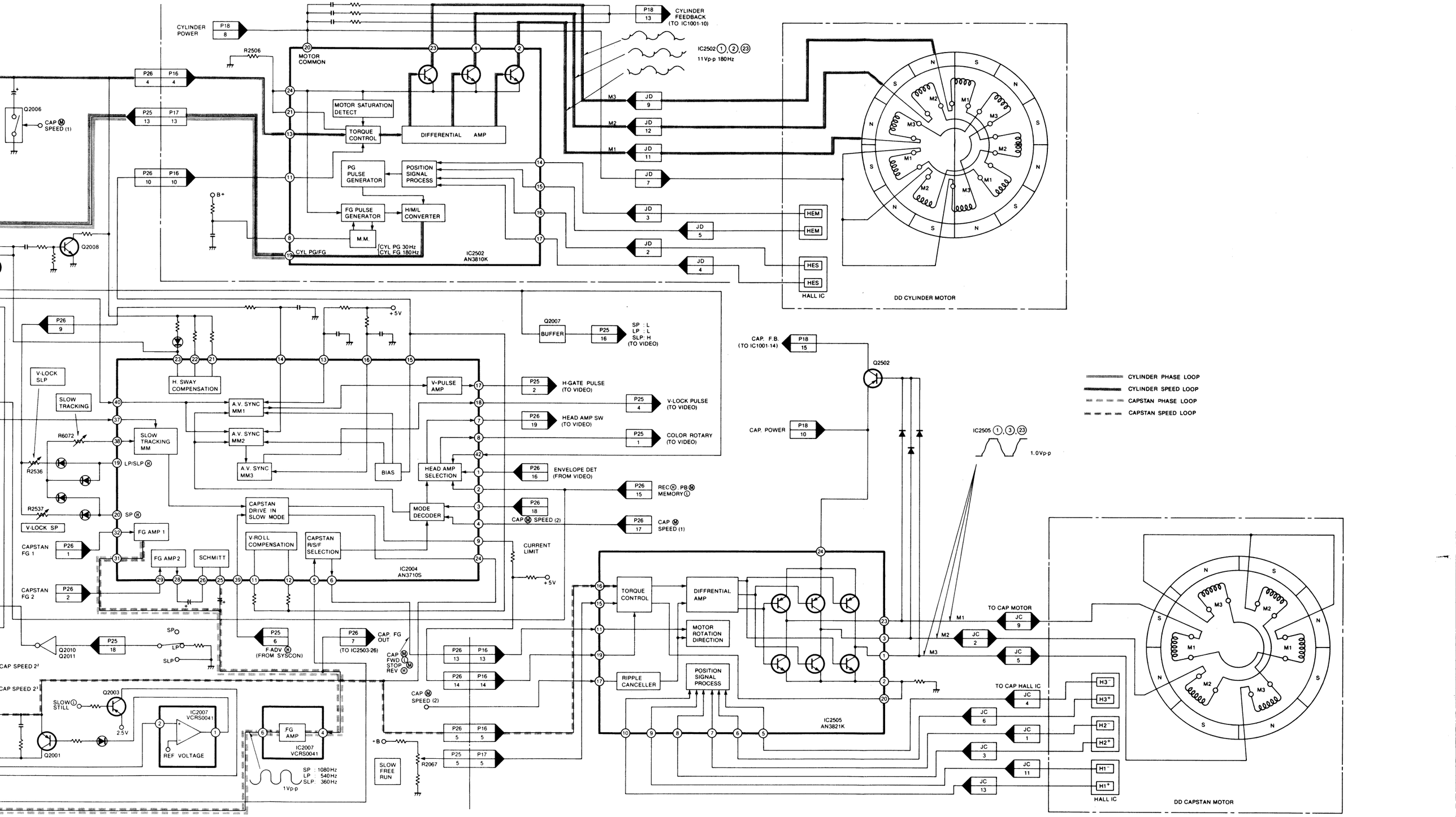
1. Connect the Deck and Tuner Unit with Multi-connector and supply a video signal on the right side panel or tune in a local on-air TV program.
2. Insert a cassette tape and make a recording in the SLP mode.
3. Connect the jumper from TP2003 to GND.
4. Connect the frequency counter to TP2001 on the Servo section.
5. Adjust the SLOW-FR (R2067) so that the frequency is 320 (+- 10)Hz.
6. Remove the frequency counter and jumper.

SERVO BLOCK DIAGRAM



SERVO BLOCK DIAGRAM

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P18 13
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IC2502 ①,②,㉓
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P25 P17 13 13
P26 P16 10 10
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CAP Ⓜ SPEED (1)
B+
Q2008
MOTOR SATURATION DETECT
TORQUE CONTROL
DIFFERENTIAL AMP
PG PULSE GENERATOR
POSITION SIGNAL PROCESS
FG PULSE GENERATOR
H/M/L CONVERTER
M.M.
CYL PG/FG
CYL PG 30Hz
CYL FG 180Hz
IC2502 AN3810K
M3
M2
M1
JD 9
JD 12
JD 11
JD 7
JD 3
JD 5
JD 2
JD 4
HEM
HEM
HES
HES
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LP : L
SLP: H
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H. SWAY COMPENSATION
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A.V. SYNC MM2
A.V. SYNC MM3
SLOW TRACKING MM
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R2536
LP/SLP Ⓗ
R2537
SP Ⓗ
V-LOCK SP
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FG AMP 2
SCHMITT
CAPSTAN FG 1
P26 1
CAPSTAN FG 2
P26 2
V-PULSE AMP
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CAP Ⓜ SPEED (1)
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CAPSTAN R/S/F SELECTION
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F.ADV Ⓗ (FROM SYSCON)
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CAP Ⓜ FWD Ⓛ STOP Ⓜ REV Ⓗ
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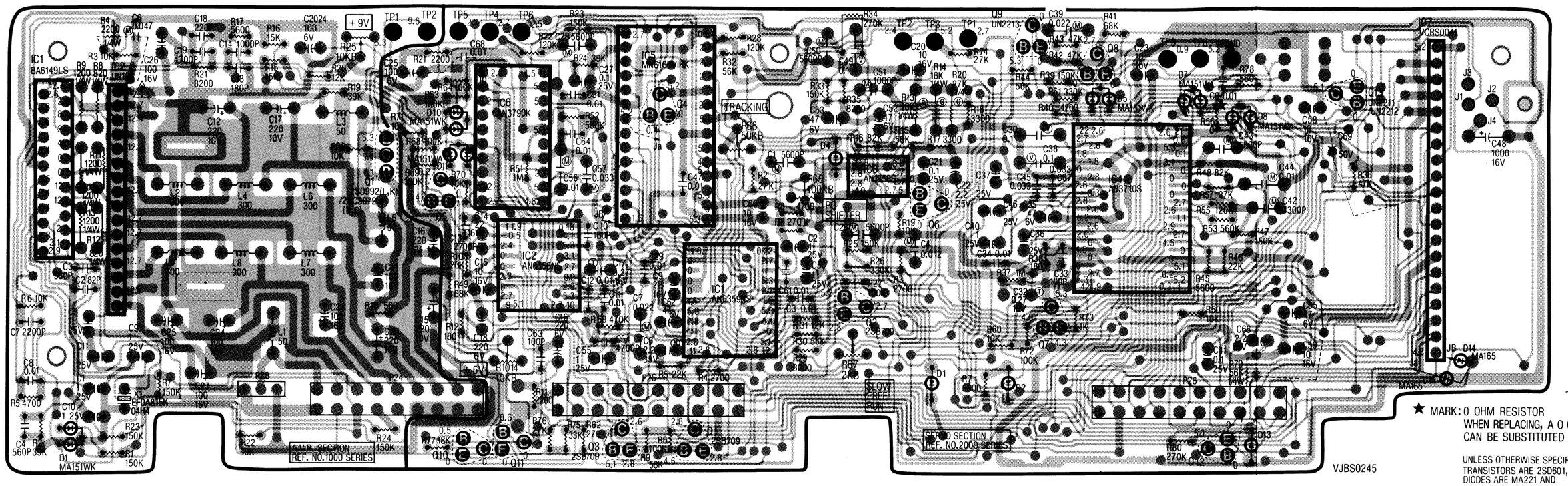
Q2010
Q2011
P25 18
SP
LP
SLP
CAP SPEED 2²
CAP SPEED 2³
SLOW Ⓛ STILL
Q2003
2.5V
Q2001
IC2007 VCRS0041
REF VOLTAGE
FG AMP
IC2007 VCRS0041
SP : 1080Hz
LP : 540Hz
SLP: 360Hz
1Vp-p
P26 P16 13 13
P26 P16 14 14
P26 P16 5 5
P25 P17 5 5
+B
R2067
SLOW FREE RUN
TORQUE CONTROL
DIFFRENTIAL AMP
MOTOR ROTATION DIRECTION
POSITION SIGNAL PROCESS
RIPPLE CANCELLER
IC2505 AN3821K
CAP. F.B. (TO IC1001-14)
P18 15
Q2502
CAP. POWER
P18 10
IC2505 ①,③,㉓
1.0Vp-p
TO CAP MOTOR
JC 9
JC 2
JC 5
M1
M2
M3
TO CAP HALL IC
JC 4
JC 6
JC 1
JC 3
JC 11
JC 13
H3⁻
H3⁺
H2⁻
H2⁺
H1⁻
H1⁺
HALL IC
DD CAPSTAN MOTOR
CYLINDER PHASE LOOP
CYLINDER SPEED LOOP
CAPSTAN PHASE LOOP
CAPSTAN SPEED LOOP

SERVO/A.V.R. C.B.A. VEPS0245E

SERVO SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL
IN SP REC MODE.

A.V.R. SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL
IN STOP MODE.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.



B

A

1 2 3 4 5 6

P24

1	GND
2	+5V
3	GND
4	+5V
5	GND
6	+9V
7	GND
8	MAIN COIL COMMON
9	SUPPLY REEL Ⓜ FEED BACK
10	CAP Ⓜ POWER
11	TAKEUP REEL Ⓜ FEED BACK
12	SUPPLY REEL Ⓜ POWER
13	CYL Ⓜ FEED BACK
14	TAKEUP REEL Ⓜ POWER
15	CAP Ⓜ FEED BACK
16	CAMERA STAND BY /TIMER SET Ⓗ
17	GND
18	+12V

P25

1	COLOR ROTARY
2	ARTIFICIAL H SYNC
3	CTL PULSE
4	ARTIFICIAL V SYNC
5	SLOW FREE RUN
6	SLOW/F ADV Ⓗ
7	CAP Ⓜ SLOW/STILL/STOP Ⓛ
8	
9	
10	SLP Ⓗ/LP Ⓜ/SP Ⓛ
11	HEAD SW
12	3.58MHz
13	CYL Ⓜ PG/FG
14	CAP Ⓜ INSERT Ⓗ /NORMAL Ⓜ/REC START Ⓛ
15	VSS
16	SP/LP/SLP
17	GND
18	SP/LP/SLP SW
19	CTL HEAD
20	GND

P26

1	CAP Ⓜ FG (1)
2	CAP Ⓜ FG (2)
3	GND
4	CYL Ⓜ TORQUE COMMAND
5	CAP Ⓜ TORQUE COMMAND
6	REC Ⓗ
7	CAP Ⓜ FG
8	CYL ON Ⓛ
9	V-LOCK
10	REF V
11	V-LOCK (SLP)
12	V-LOCK (SP)
13	CAP Ⓜ REV Ⓗ/STOP Ⓜ/FWD Ⓛ
14	CURRENT LIMIT
15	TAPE SPEED REC Ⓗ/PB Ⓜ/MEMO Ⓛ
16	ENVELOPE
17	CAP Ⓜ SPEED (1)
18	CAP Ⓜ SPEED (2)
19	HEAD AMP SW
20	CAP Ⓜ REV Ⓗ/STOP Ⓜ/FWD Ⓛ

P28

1	+5V
2	+12V
3	GND

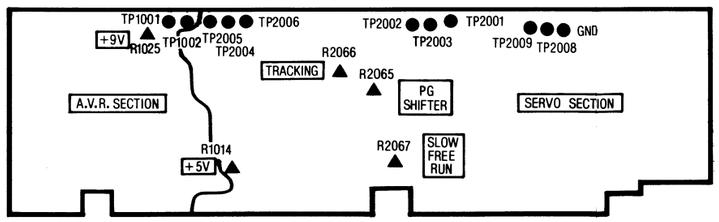
JUMPER

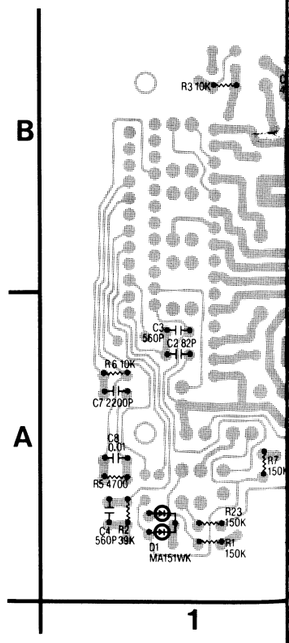
1	SLOW TRACKING
2	TRACKING
3	SLOW TRACKING
4	BRAKE BACKUP

SERVO SECTION	
Q1	3-A
Q2	4-A
Q3	3-A
Q4	3-B
Q5	2-B
Q6	4-B
Q7	5-A
Q8	5-B
Q9	4-B
Q10	2-A
Q11	3-A
Q12	5-A
Q13	6-B

A.V.R. SECTION	
Q1	2-B

LOCATION OF TEST POINTS & ADJUSTMENT POINTS



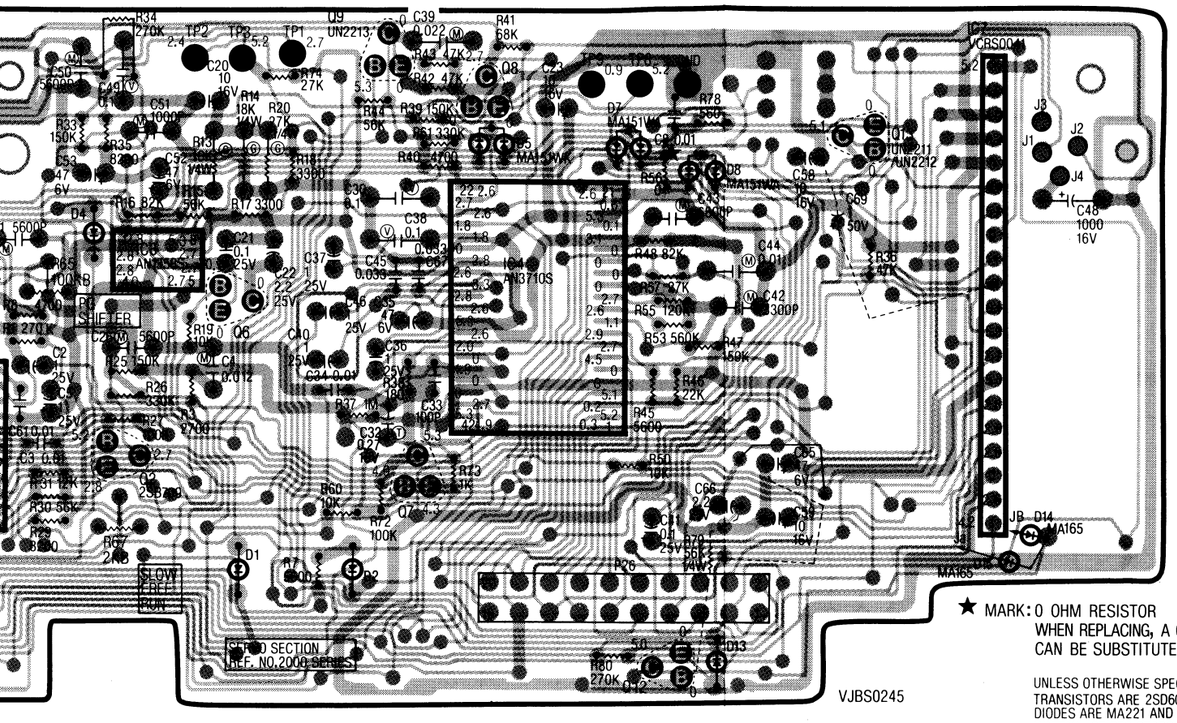


V.R. SECTION
LTAGE MEASUREMENT : COLOR BAR SIGNAL
IN STOP MODE.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.

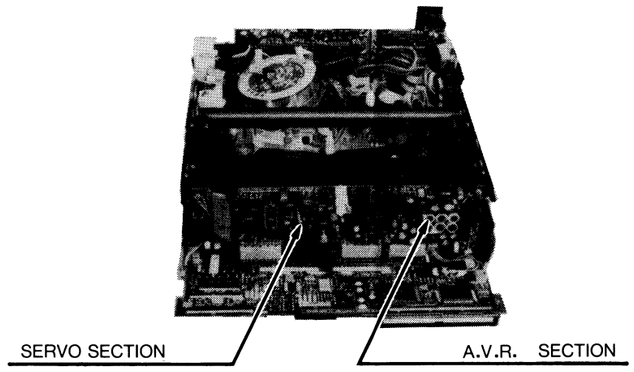
SERVICE CAUTION:
WHEN SERVICING CHIP PARTS, PLEASE USE THE SOLDERING IRON LESS THAN 40 WATTS.



VJBS0245

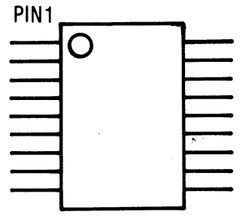
★ MARK: 0 OHM RESISTOR
WHEN REPLACING, A 0 OHM RESISTOR CAN BE SUBSTITUTED BY A WIRE.

UNLESS OTHERWISE SPECIFIED;
TRANSISTORS ARE 2SD601,
DIODES ARE MA221 AND
WATTAGE OF RESISTORS ARE 1/16W.



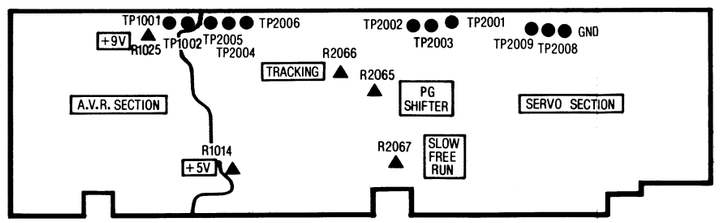
SERVO/A.V.R. C.B.A.

PIN 1 OF FLAT PACKAGE IC IS INDICATED BY THE DOT ON IC.

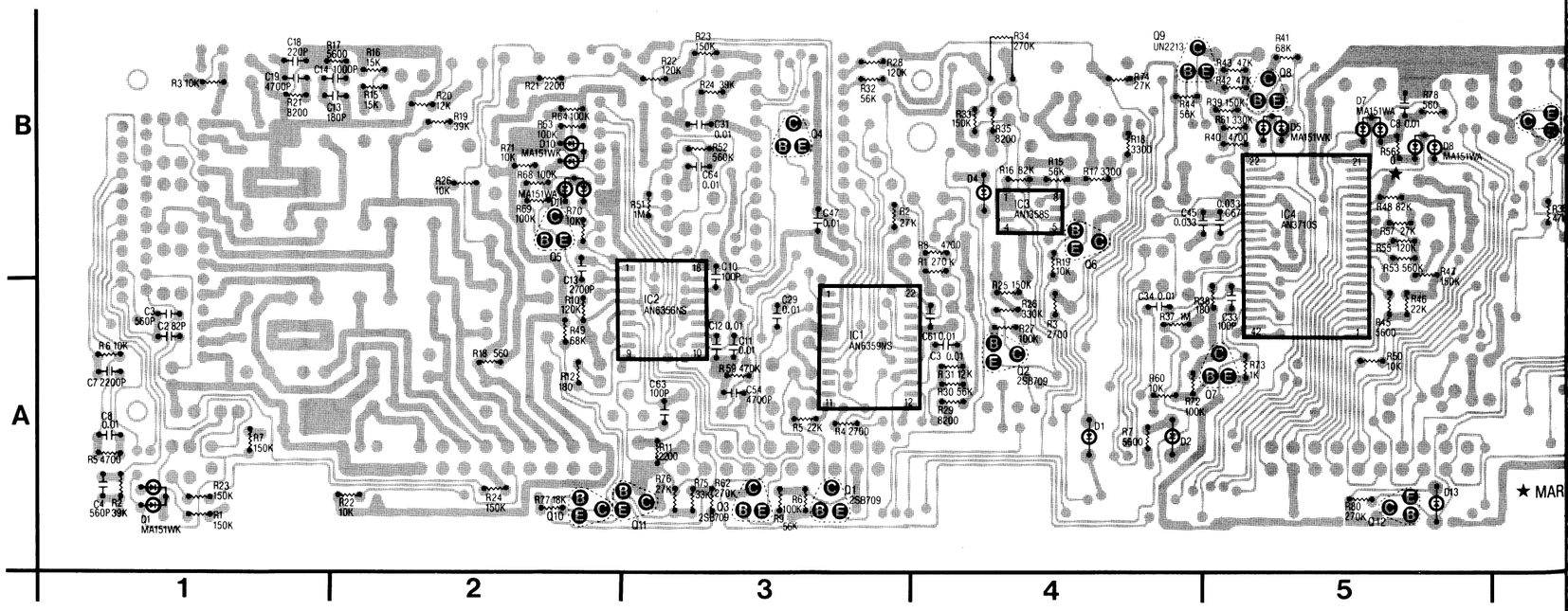


4 5 6

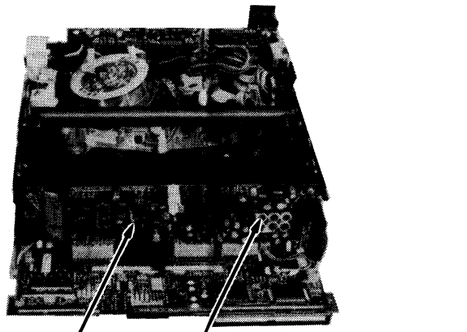
LOCATION OF TEST POINTS & ADJUSTMENT POINTS



SERVO/A.V.R. C.B.A. VEPS0245E (CHIP PARTS VIEW)



MANY OTHER SEMICONDUCTOR DEVICES ARE
AND THEREFORE REQUIRE THE SPECIAL
ED UNDER THE "ELECTROSTATICALLY SENSITIVE
S SERVICE MANUAL.

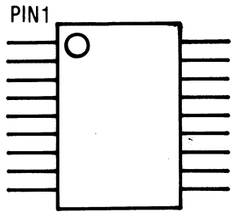


SECTION A.V.R. SECTION

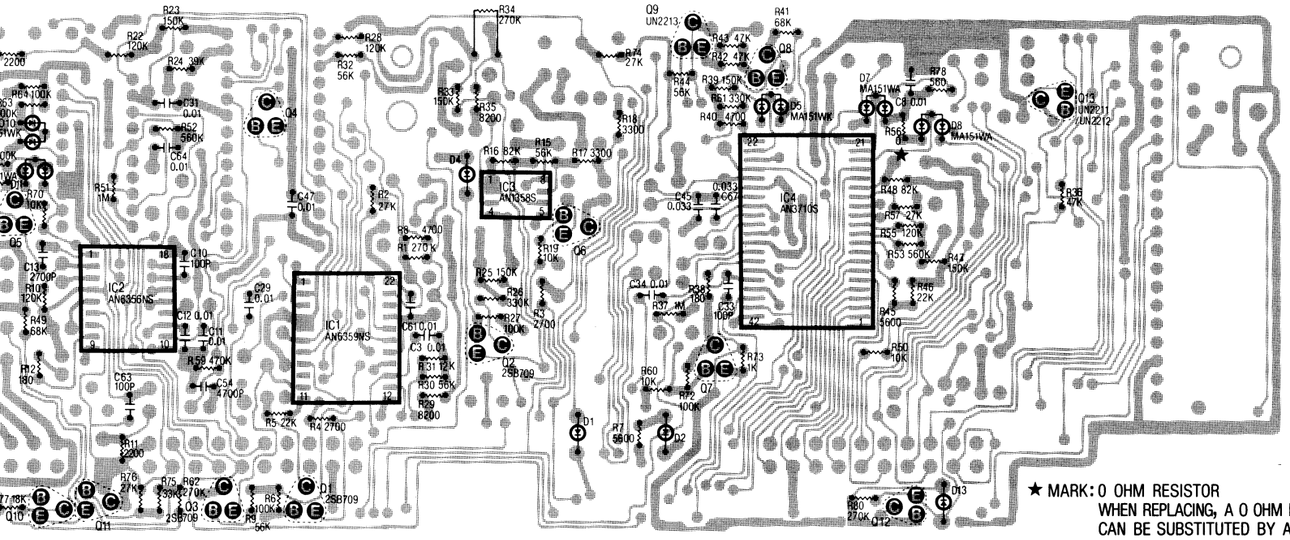
SERVO/A.V.R. C.B.A.

SERVICE CAUTION:
WHEN SERVICING CHIP PARTS,
PLEASE USE THE SOLDERING IRON
LESS THAN 40 WATTS.

PIN 1 OF FLAT PACKAGE IC IS INDICATED BY
THE DOT ON IC.



RVO/A.V.R. C.B.A. VEPS0245E (CHIP PARTS VIEW)


IC1 AN6359NS
IC2 AN6358NS
IC3 AN358S
IC4 AN3710S
D1 2SB709
D2 2SB709
D3 2SB709
D4
D5 MA151WK
D7 MA151WA
D8 MA151WA
D9 UN2213
Q10
Q11
Q12
Q13 UN2211 UN2212
Q4
Q5
Q6
Q7
Q8
R23 150K
R22 120K
R24 39K
R28 120K
R32 56K
R34 270K
R33 150K
R35 6200
R41 68K
R43 47K
R42 47K
R39 150K
R51 330K
R40 470
R44 56K
R4 27K
R18 3300
R15 56K
R16 82K
R17 3300
R78 560
C8 0.01
R58 0
R48 82K
R57 27K
R55 120K
R53 560K
R47 150K
R45 22K
R46 6800
R50 10K
R23 1K
R72 100K
R60 10K
R80 270K
R36 47K
C45 0.033
C67 0.033
C34 0.01
R37 1M
C33 100P
R38 150
R25 150K
R26 330K
R27 10K
R3 2700
R19 10K
R8 4700
R1 270K
R2 27K
C47 0.01
C64 0.01
C31 0.01
R52 560K
R51 1M
R70 10K
C13 2700P
R10 120K
R49 68K
R22 180
C29 0.01
C10 100P
C11 0.01
C12 0.01
C61 0.01
C3 0.01
R59 470K
C54 4700P
C63 100P
R31 12K
R30 56K
R29 6200
R11 2200
R5 22K
R4 2700
R7 5600
R76 27K
R75 39K
R82 270K
R81 10K
R9 56K
R6 10K
R77 68K
R83 100K
R84 100K
R85 100K
R86 100K
C62 0.01
C60 0.01
C59 0.01
C58 0.01
C57 0.01
C56 0.01
C55 0.01
C53 0.01
C52 0.01
C51 0.01
C50 0.01
C49 0.01
C48 0.01
C46 0.01
C44 0.01
C43 0.01
C42 0.01
C41 0.01
C40 0.01
C39 0.01
C38 0.01
C37 0.01
C36 0.01
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C16 0.01
C15 0.01
C14 0.01
C9 0.01
C7 0.01
C5 0.01
C4 0.01
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C1 0.01
C65 0.01
C66 0.01
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C69 0.01
C70 0.01
C71 0.01
C72 0.01
C73 0.01
C74 0.01
C75 0.01
C76 0.01
C77 0.01
C78 0.01
C79 0.01
C80 0.01
C81 0.01
C82 0.01
C83 0.01
C84 0.01
C85 0.01
C86 0.01
C87 0.01

REF.NO. / MODE	IC2006																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0.1	4.6	0	0	5.3	★	★	5.3	5.3	2.4	0	5.3	5.3	★	5.3	★	0	0.1	5.0	4.8
REC	2.7	0.2	0	0	0	★	★	5.2	4.1	2.0	4.5	5.3	5.3	★	5.3	★	0	2.7	5.0	4.8
PLAY	2.7	0.2	0	0	0	★	★	5.2	4.1	2.0	0	5.3	5.3	★	5.3	★	0	2.7	5.0	4.8
CUE	4.2	4.8	0	0	0	★	★	5.2	4.1	0	0	0.1	0	★	5.3	★	0	2.7	5.0	1.3
REV	2.7	4.8	0	0	5.3	★	★	5.2	4.2	2.0	0	0.1	0	★	5.3	★	0	2.7	5.0	1.7
SLOW(1/4)	2.7	0	0	0	0	★	★	5.2	4.1	2.0	0	5.2	5.3	★	5.3	★	0	2.7	5.0	4.8
F.A	2.7	0	0	0	0	★	★	5.2	4.1	2.0	0	5.2	5.3	★	5.3	★	0	2.7	5.0	4.8

REF.NO. / MODE	IC2007																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0.5	1.8	0	2.6	2.6	2.6	5.3	0	5.3	2.1	0	1.1	0	5.1	5.1	2.1	4.6	4.9	0	5.1
REC	4.2	2.6	0	2.6	2.6	2.6	5.3	2.7	5.3	0.1	5.1	1.1	0	5.1	5.1	0	0.2	4.9	4.5	5.2
PLAY	4.1	2.6	0	2.6	2.6	2.6	5.3	2.4	5.3	2.1	0	1.1	0	0	5.1	0	0.2	4.9	0	2.1
CUE	4.1	2.5	0	2.6	2.6	2.6	5.3	2.3	5.3	2.1	0	1.1	0	0	5.1	0	4.8	0	0	2.1
REV	4.1	2.6	0	2.6	2.6	2.6	5.3	2.5	5.3	2.1	0	1.1	0	0	5.1	4.9	4.8	0	0	2.1
SLOW(1/4)	★	2.1	0	2.6	2.6	2.6	5.3	2.4	5.3	2.1	0	1.1	0	0	0	0	0	0.6	0	0
F.A	★	★	0	2.6	2.6	2.6	5.3	2.4	5.3	2.1	0	1.1	0	0	0	0	0	0.6	0	0

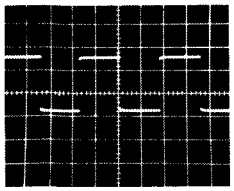
REF.NO. / MODE	Q2001			Q2002			Q2003			Q2004			Q2005			Q2006			Q2007		
	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
STOP	1.8	1.2	1.8	2.8	2.2	2.8	2.8	2.2	2.8	0	−0.4	5.1	0	0.6	0.1	0	0.1	2.4	4.2	4.9	5.3
REC	2.8	4.6	2.8	2.8	5.2	2.7	2.8	5.1	2.6	0	−0.4	5.2	0	0.4	0.2	0	0.7	0	4.3	4.9	5.3
PLAY	2.8	4.6	2.8	2.8	5.1	2.6	2.8	5.1	2.5	0	−0.4	5.1	0	0.3	0.1	0	0.7	0	4.3	4.9	5.3
CUE	2.8	4.6	2.8	2.8	5.1	2.6	2.8	5.1	2.9	0	0.4	5.1	0	0.3	4.4	0	0.5	0.1	0.3	0	5.3
REV	2.8	0	2.8	2.8	5.1	2.4	2.8	5.1	2.4	0	−0.5	5.1	0	0.3	4.4	0	0.6	0	0	0	5.3
SLOW(1/4)	2.8	2.1	2.7	2.8	2.2	2.8	2.8	2.2	2.7	0	−0.4	5.1	0	0.3	0.1	0	0.1	0.2	4.3	0.6	5.3
F.A	2.9	2.3	2.9	2.8	2.2	2.8	2.8	2.2	2.7	0	−0.4	5.1	0	0.3	0.1	0	0	0.1	0	0.6	5.3

REF.NO. / MODE	Q2008			Q2009			Q2010			Q2011			Q2012			Q2013					
	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C			
STOP	0	0	4.0	0	5.3	0	0	0.5	0	0	0.6	0.1	0	0	1.4	0	0	5.1			
REC	0	0	2.7	0	5.3	0	0	0.5	0	0	0.6	0	0	0	5.0	0	0	5.1			
PLAY	0	0	2.7	0	5.3	0	0	0.5	0	0	0.6	0	0	0	5.0	0	0	5.1			
CUE	0	0	2.7	0	0	5.3	0	0.5	0	0	0.6	0	0	0	5.0	0	0	5.1			
REV	0	0	2.7	0	0	0	0	0.5	0	0	0.6	0	0	0	5.0	0	0	5.1			
SLOW(1/4)	0	0	2.7	0	5.3	0	0	0.5	0	0	0.6	0	0	0	1.4	0	0	0			
F.A	0	0	2.7	0	5.3	0	0	0.5	0	0	0.6	0	0	0	1.4	0	0	0			

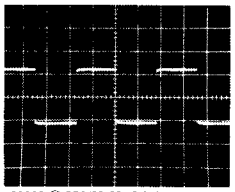
REF.NO. / MODE	TP2001	TP2002	TP2003	TP2004	TP2005	TP2006	TP2008	TP2009												
STOP	2.7	1.9	0.6	0.1	2.6	2.7	5.3	5.4												
REC	2.7	2.4	5.2	2.7	2.7	2.5	5.2	0.9												
PLAY	2.7	1.9	5.2	2.7	2.7	2.5	5.2	0.9												
CUE	2.7	1.9	5.2	2.7	2.7	2.4	5.2	1.7												
REV	2.7	1.9	5.2	2.7	2.7	2.4	5.2	1.7												
SLOW(1/4)	2.7	2.0	0.6	2.7	2.7	2.6	5.2	0.9												
F.A	2.7	1.9	0.6	2.7	2.7	2.7	5.2	0.9												

VOLTAGE MEASUREMENT:
1. CUE, REVIEW, FRAME ADVANCE, SLOW.
   COLOR BAR SIGNAL IN SLP MODE.
2. OTHERS
   COLOR BAR SIGNAL IN SP MODE.

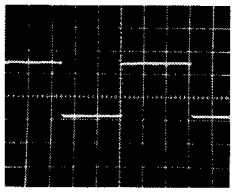
★ : UNMEASURABLE OR UNNECESSARY TO MEASURE.



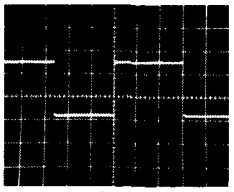
IC2005 ⑱ REC/PB SP.LP.SLP
2V/20Usec. div.



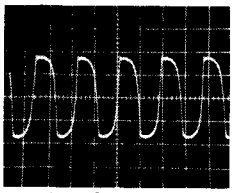
IC2005 ② REC/PB SP.LP.SLP
2V/20Usec. div.



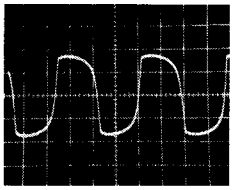
TP2005 (IC2005 ⑰) REC/PB SP.LP.SLP
2V/50Usec. div.



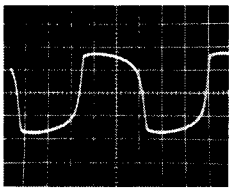
TP2006 (IC2005 ③) REC/PB SP.LP.SLP
2V/50Usec. div.



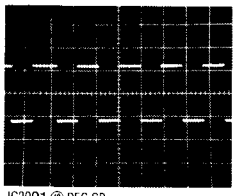
TP2001 (IC2001 ⑳) REC SP
0.2V/0.5msec. div.



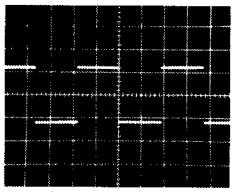
TP2001 (IC2001 ㉑) REC LP
0.2V/0.5msec. div.



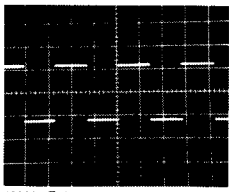
TP2001 (IC2001 ㉒) REC SLP
0.2V/0.5msec. div.



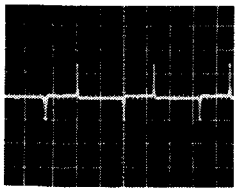
IC2001 ⑬ REC SP
2V/1msec. div.



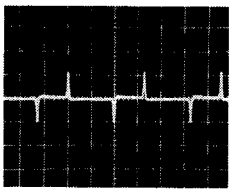
IC2001 ⑱ REC LP
2V/1msec. div.



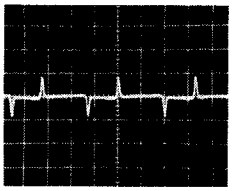
IC2001 ⑯ REC SLP
2V/1msec. div.



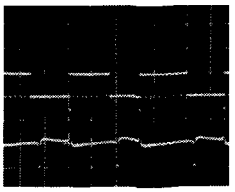
TP2002 PB SP
1V/10msec. div.



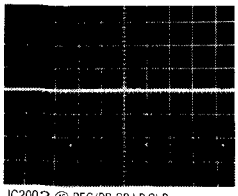
TP2002 PB LP
1V/10msec. div.



TP2002 PB SLP
1V/10msec. div.



UP IC2002 ⑭ PB SP
5V/10msec. div.
DOWN TP2002 PB SP
1V/10msec. div.



IC2002 ⑯ REC/PB SP.LP.SLP
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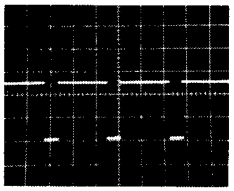
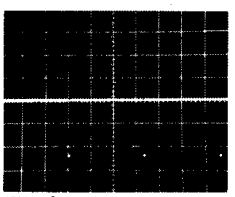


IC2002 ⑰ REC/PB SP.LP.SLP
2V/2msec. div.



IC2005 ⑤REC SP.LP.SLP
2V/5msec. div.

SERVO/A.V.R. SCHEMATIC DIAGRAM

A.V.R. SECTION
VOLTAGE MEASUREMENT : COLOR BAR SIGNAL IN STOP MODE.

SERVO SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

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SERVO SECTION	
Q2001	4-C
Q2002	3-C
Q2003	3-C
Q2004	8-C
Q2005	5-C
Q2006	5-B
Q2007	2-B
Q2008	5-B
Q2009	5-A
Q2010	2-C
Q2011	2-C
Q2012	6-C
Q2013	2-C

A.V.R. SECTION	
Q1001	9-C

CALLOUTS NEXT TO WIRING PLUGS INDICATE CONNECTIONS TO OTHER SCHEMATIC DIAGRAM

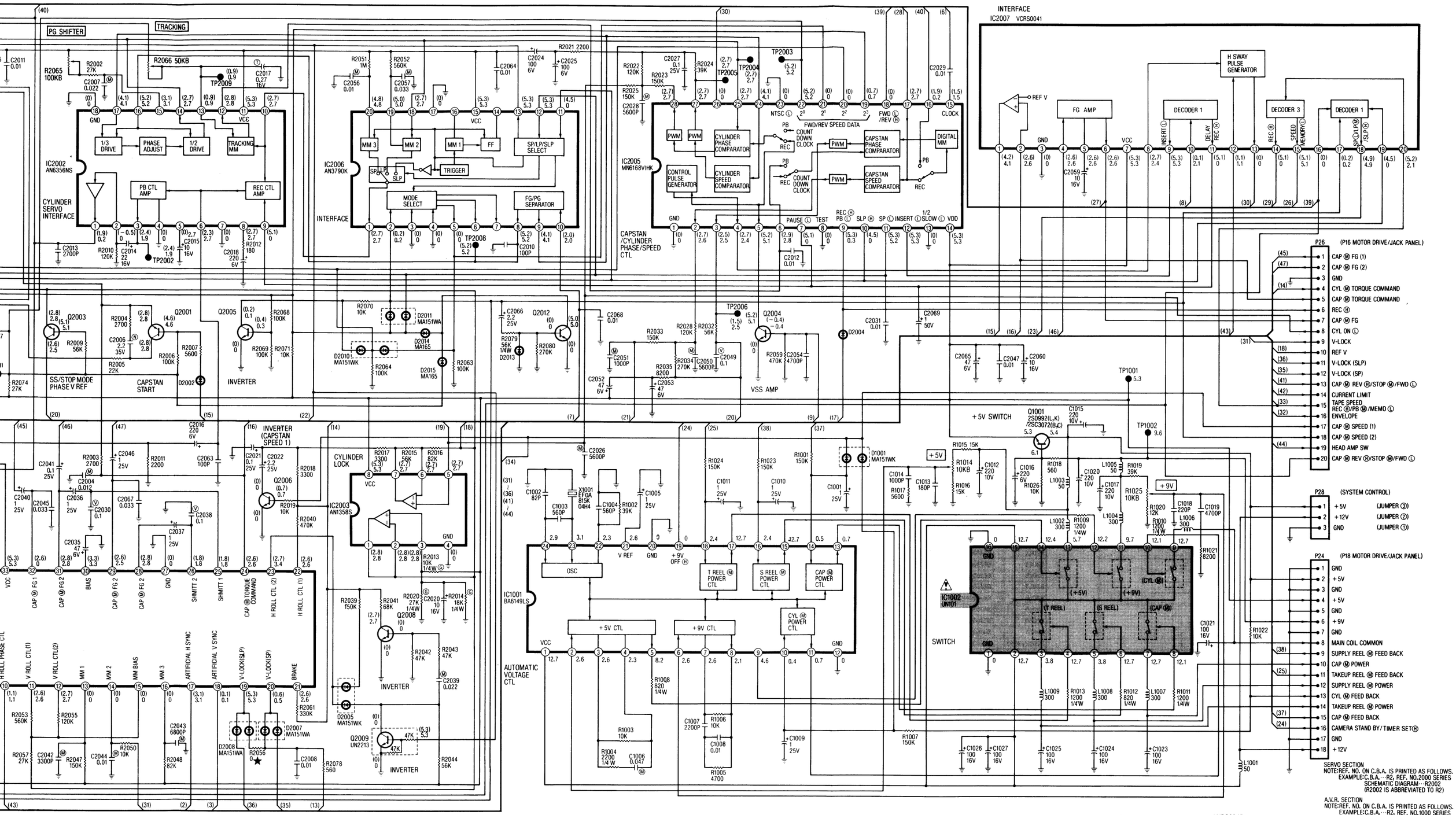
★ MARK: 0 OHM RESISTOR
WHEN REPLACING, A 0 OHM RESISTOR CAN BE SUBSTITUTED BY A WIRE.

R. SECTION
TAGE MEASUREMENT : COLOR BAR SIGNAL
IN STOP MODE.

SERVO SECTION
VOLTAGE MEASUREMENT:
COLOR BAR SIGNAL IN SP REC MODE WITH BRACKET.
COLOR BAR SIGNAL IN SP PLAY MODE WITHOUT BRACKET.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

SPECIAL NOTE:
ALL INTEGRATED CIRCUITS AND MANY OTHER SEMICONDUCTOR DEVICES ARE ELECTROSTATICALLY SENSITIVE AND THEREFORE REQUIRE THE SPECIAL HANDLING TECHNIQUES DESCRIBED UNDER THE "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" SECTION OF THIS SERVICE MANUAL.



ELECTRICAL REPLACEMENT PARTS LIST

Model No. PV-8000

Special Note:
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "Electrostatically Sensitive (ES) Devices" section of this service manual.

Note:
1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
   Components identified by the sign ⚠ have special characteristics important for safety.
   When replacing any of these components, Use only the specified parts.
3. Unless otherwise specified
   All resistors are in OHMS (Ω), 1/4W, ±5%, carbon, K=1,000Ω, M=1,000KΩ.
   All capacitors are in MICROFARADS (UF), P=UUF, ±10%.
   All coils are in MICROHENRIES (UH), M=10³U, ±10%.
4. C.B.A.: Circuit Board Assembly.
5. P.C.B.: Print Circuit Board.

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
		VEPS0245E	SERVO/A.V.R. C.B.A		
			INTEGRATED CIRCUITS		
IC1001		BA6149LS		1	
IC1002	⚠	UN101		1	
IC2001		AN6359NS		1	
IC2002		AN6356NS		1	
IC2003		AN1358S		1	
IC2004		AN3710S		1	
IC2005		MN6168VIHK		1	
IC2006		AN3790K		1	
IC2007		VCRS0041		1	
			TRANSISTORS		
Q1001		2SC3072(B,C)		1	
		OR 2SD992(L,K)			
Q2001-2003		2SB709	CHIP	3	
Q2004-2008		2SD601	CHIP	5	
Q2009		UN2213	CHIP	1	
Q2010-2012		2SD601	CHIP	3	
Q2013		UN2211	CHIP	1	
		OR UN2212	CHIP		
			DIODES		
D1001		MA151WK	CHIP	1	
D2001,2002		MA221	CHIP	2	
D2004		MA221	CHIP	1	
D2005		MA151WK	CHIP	1	
D2007,2008		MA151WA	CHIP	2	
D2010		MA151WK	CHIP	1	
D2011		MA151WA	CHIP	1	
D2013		MA221	CHIP	1	
D2014,2015		MA165		2	
			RESISTORS		
R1001		ERJ6GCJ154V	CHIP 1/16W 150K	1	
R1002		ERJ6GCJ393V	CHIP 1/16W 39K	1	
R1003		ERJ6GCJ103V	CHIP 1/16W 10K	1	
R1004		ERDS2TJ222	2.2K	1	
R1005		ERJ6GCJ472V	CHIP 1/16W 4.7K	1	
R1006		ERJ6GCJ103V	CHIP 1/16W 10K	1	
R1007		ERJ6GCJ154V	CHIP 1/16W 150K	1	
R1008		ERDS2TJ821	820	1	
R1009-1011		ERDS2TJ122	1.2K	3	
R1012		ERDS2TJ821	820	1	
R1013		ERDS2TJ122	1.2K	1	
R1014		EVML3GA00B14	VARIABLE 10K	1	
R1015,1016		ERJ6GCJ153V	CHIP 1/16W 15K	2	
R1017		ERJ6GCJ562V	CHIP 1/16W 5.6K	1	
R1018		ERJ6GCJ561V	CHIP 1/16W 560	1	
R1019		ERJ6GCJ393V	CHIP 1/16W 39K	1	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
R1020		ERJ6GCJ123V	CHIP 1/16W 12K	1	
R1021		ERJ6GCJ822V	CHIP 1/16W 8.2K	1	
R1022		ERJ6GCJ103V	CHIP 1/16W 10K	1	
R1023,1024		ERJ6GCJ154V	CHIP 1/16W 150K	2	
R1025		EVML3GA00B14	VARIABLE 10K	1	
R1026		ERJ6GCJ103V	CHIP 1/16W 10K	1	
R2001		ERJ6GCJ274V	CHIP 1/16W 270K	1	
R2002		ERJ6GCJ273V	CHIP 1/16W 27K	1	
R2003,2004		ERJ6GCJ272V	CHIP 1/16W 2.7K	2	
R2005		ERJ6GCJ223V	CHIP 1/16W 22K	1	
R2006		ERJ6GCJ104V	CHIP 1/16W 100K	1	
R2007		ERJ6GCJ562V	CHIP 1/16W 5.6K	1	
R2008		ERJ6GCJ472V	CHIP 1/16W 4.7K	1	
R2009		ERJ6GCJ563V	CHIP 1/16W 56K	1	
R2010		ERJ6GCJ124V	CHIP 1/16W 120K	1	
R2011		ERJ6GCJ222V	CHIP 1/16W 2.2K	1	
R2012		ERJ6GCJ181V	CHIP 1/16W 180	1	
		OR ERJ6GMJ181V	CHIP 1/16W 180		
R2013		EROS2TKG1002	PRECISION METAL FILM 10K +-2%	1	
R2014		EROS2TKG1802	PRECISION METAL FILM 18K +-2%	1	
R2015		ERJ6GCJ563V	CHIP 1/16W 56K	1	
R2016		ERJ6GCJ823V	CHIP 1/16W 82K	1	
R2017,2018		ERJ6GCJ332V	CHIP 1/16W 3.3K	2	
R2019		ERJ6GCJ103V	CHIP 1/16W 10K	1	
R2020		EROS2TKG2702	PRECISION METAL FILM 27K +-2%	1	
R2021		ERJ6GCJ222V	CHIP 1/16W 2.2K	1	
R2022		ERJ6GCJ124V	CHIP 1/16W 120K	1	
R2023		ERJ6GCJ154V	CHIP 1/16W 150K	1	
R2024		ERJ6GCJ393V	CHIP 1/16W 39K	1	
R2025		ERJ6GCJ154V	CHIP 1/16W 150K	1	
R2026		ERJ6GCJ334V	CHIP 1/16W 330K	1	
R2027		ERJ6GCJ104V	CHIP 1/16W 100K	1	
R2028		ERJ6GCJ124V	CHIP 1/16W 120K	1	
R2029		ERJ6GCJ822V	CHIP 1/16W 8.2K	1	
R2030		ERJ6GCJ563V	CHIP 1/16W 56K	1	
R2031		ERJ6GCJ123V	CHIP 1/16W 12K	1	
R2032		ERJ6GCJ563V	CHIP 1/16W 56K	1	
R2033		ERJ6GCJ154V	CHIP 1/16W 150K	1	
R2034		ERJ6GCJ274V	CHIP 1/16W 270K	1	
R2035		ERJ6GCJ822V	CHIP 1/16W 8.2K	1	
R2036		ERJ6GCJ473V	CHIP 1/16W 47K	1	
R2037		ERJ6GCJ105V	CHIP 1/16W 1M	1	
R2038		ERJ6GCJ181V	CHIP 1/16W 180	1	
		OR ERJ6GMJ181V	CHIP 1/16W 180		
R2039		ERJ6GCJ154V	CHIP 1/16W 150K	1	
R2040		ERJ6GCJ474V	CHIP 1/16W 470K	1	
R2041		ERJ6GCJ683V	CHIP 1/16W 68K	1	
R2042,2043		ERJ6GCJ473V	CHIP 1/16W 47K	2	
R2044		ERJ6GCJ563V	CHIP 1/16W 56K	1	
R2045		ERJ6GCJ562V	CHIP 1/16W 5.6K	1	
R2046		ERJ6GCJ223V	CHIP 1/16W 22K	1	
R2047		ERJ6GCJ154V	CHIP 1/16W 150K	1	
R2048		ERJ6GCJ823V	CHIP 1/16W 82K	1	
R2049		ERJ6GCJ683V	CHIP 1/16W 68K	1	
R2050		ERJ6GCJ103V	CHIP 1/16W 10K	1	
R2051		ERJ6GCJ105V	CHIP 1/16W 1M	1	
R2052,2053		ERJ6GCJ564V	CHIP 1/16W 560K	2	
R2055		ERJ6GCJ124V	CHIP 1/16W 120K	1	
R2056	★	ERJ6GC0R00V	CHIP 1/16W 0	1	
R2057		ERJ6GCJ273V	CHIP 1/16W 27K	1	
R2059		ERJ6GCJ474V	CHIP 1/16W 470K	1	
R2060		ERJ6GCJ103V	CHIP 1/16W 10K	1	
R2061		ERJ6GCJ334V	CHIP 1/16W 330K	1	
R2062		ERJ6GCJ274V	CHIP 1/16W 270K	1	
R2063,2064		ERJ6GCJ104V	CHIP 1/16W 100K	2	
R2065		EVML3GA00B15	VARIABLE 100K	1	
R2066		EVML3GA00B54	VARIABLE 50K	1	
R2067		EVML3GA00B23	VARIABLE 2K	1	
R2068,2069		ERJ6GCJ104V	CHIP 1/16W 100K	2	
R2070,2071		ERJ6GCJ103V	CHIP 1/16W 10K	2	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
R2072		ERJ6GCJ104V	CHIP 1/16W 100K	1	
R2073		ERJ6GCJ102V	CHIP 1/16W 1K	1	
R2074		ERJ6GCJ273V	CHIP 1/16W 27K	1	
R2075		ERJ6GCJ333V	CHIP 1/16W 33K	1	
R2076		ERJ6GCJ273V	CHIP 1/16W 27K	1	
R2077		ERJ6GCJ183V	CHIP 1/16W 18K	1	
R2078		ERJ6GCJ561V	CHIP 1/16W 560	1	
R2079		ERDS2TJ563	56K	1	
R2080		ERJ6GCJ274V	CHIP 1/16W 270K	1	
			CAPACITORS		
C1001		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C1002		VCUSABH820KB	CERAMIC CHIP 50V 82P	1	
C1003,1004		VCUSABH561KB	CERAMIC CHIP 50V 560P	2	
C1005		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
C1006		ECQB1H473JZ	POLYESTER 50V 0.047 +-5%	1	
		OR ECQV1H473KZ	POLYESTER 50V 0.047		
C1007		VCUSABH222KB	CERAMIC CHIP 50V 0.0022	1	
C1008		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C1009-1011		ECEA1EKK010	ELECTROLYTIC 25V 1	3	
C1012		ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1013		VCUSABH181KB	CERAMIC CHIP 50V 180P	1	
C1014		VCUSABH101KB	CERAMIC CHIP 50V 100P	1	
C1015		ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1016		ECEAOJK221S	ELECTROLYTIC 6.3V 220	1	
C1017		ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1018		VCUSABH221KB	CERAMIC CHIP 50V 220P	1	
C1019		VCUSABH472KB	CERAMIC CHIP 50V 0.0047	1	
C1020		ECEA1AK221Z	ELECTROLYTIC 10V 220	1	
C1021		ECEA1CK101X	ELECTROLYTIC 16V 100	1	
C1023-1027		ECEA1CK101X	ELECTROLYTIC 16V 100	5	
C2001		ECQB1H562KH	POLYESTER 50V 0.0056	1	
C2002		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
		OR ECEA1EKS010	ELECTROLYTIC 25V 1		
C2003		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2004		ECQB1H123KH	POLYESTER 50V 0.012	1	
C2005		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
		OR ECEA1EKS010	ELECTROLYTIC 25V 1		
C2006		ECEA1VSN2R2	ELECTROLYTIC 35V 2.2	1	
C2007		ECQB1H223KH	POLYESTER 50V 0.022	1	
C2008		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2009		ECEA1CKS220	ELECTROLYTIC 16V 22	1	
C2010		VCUSABH102KB	CERAMIC CHIP 50V 0.001	1	
C2011,2012		VCUSABH103KB	CERAMIC CHIP 50V 0.01	2	
C2013		VCUSABH272KB	CERAMIC CHIP 50V 0.0027	1	
C2014		ECEA1CKS220	ELECTROLYTIC 16V 22	1	
C2015		ECEA1CKK100	ELECTROLYTIC 16V 10	1	
		OR ECEA1CKS100	ELECTROLYTIC 16V 10		
C2016		ECEAOJK221X	ELECTROLYTIC 6.3V 220	1	
C2017		ECSF16ER27K	TANTALUM 16V 0.27	1	
C2018		ECEAOJK221X	ELECTROLYTIC 6.3V 220	1	
C2020		ECEA1CKK100	ELECTROLYTIC 16V 10	1	
		OR ECEA1CKS100	ELECTROLYTIC 16V 10		
C2021		ECEA1EKK0R1	ELECTROLYTIC 25V 0.1	1	
		OR ECEA1EKS0R1	ELECTROLYTIC 25V 0.1		
C2022		ECEA1EKK2R2	ELECTROLYTIC 25V 2.2	1	
		OR ECEA1EKS2R2	ELECTROLYTIC 25V 2.2		
C2023		ECEA1CKK100	ELECTROLYTIC 16V 10	1	
		OR ECEA1CKS100	ELECTROLYTIC 16V 10		
C2024,2025		ECEAOJKS101	ELECTROLYTIC 6.3V 100	2	
C2026		ECQB1H562KH	POLYESTER 50V 0.0056	1	
C2027		ECEA1EKK0R1	ELECTROLYTIC 25V 0.1	1	
		OR ECEA1EKS0R1	ELECTROLYTIC 25V 0.1		
C2028		ECQB1H562KH	POLYESTER 50V 0.0056	1	
C2029		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2030		ECQV1H104KH	POLYESTER 50V 0.1	1	
C2031		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2032		ECSF16ER27K	TANTALUM 16V 0.27	1	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
C2033		VCUSABH102KB	CERAMIC CHIP 50V 0.001	1	
C2034		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2035		ECEAOJKS470	ELECTROLYTIC 6.3V 47	1	
C2036,2037		ECEA1EKK010	ELECTROLYTIC 25V 1	2	
		OR ECEA1EKS010	ELECTROLYTIC 25V 1		
C2038		ECQV1H104KH	POLYESTER 50V 0.1	1	
C2039		ECQB1H223KH	POLYESTER 50V 0.022	1	
C2040		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
		OR ECEA1EKS010	ELECTROLYTIC 25V 1		
C2041		ECEA1EKK0R1	ELECTROLYTIC 25V 0.1	1	
		OR ECEA1EKS0R1	ELECTROLYTIC 25V 0.1		
C2042		ECQB1H332KH	POLYESTER 50V 0.0033	1	
C2043		ECQB1H682KH	POLYESTER 50V 0.0068	1	
C2044		ECQB1H103KH	POLYESTER 50V 0.01	1	
C2045		VCUSABE3332F	CERAMIC CHIP 25V 0.033	1	
		OR	+80%-20%		
		VCUSABH3332F	CERAMIC CHIP 50V 0.033		
			+80%-20%		
C2046		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
		OR ECEA1EKS010	ELECTROLYTIC 25V 1		
C2047		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2048		ECEA1CU102	ELECTROLYTIC 16V 1000	1	
C2049		ECQV1H104KH	POLYESTER 50V 0.1	1	
C2050		ECQB1H562KH	POLYESTER 50V 0.0056	1	
C2051		ECQB1H102KH	POLYESTER 50V 0.001	1	
C2052,2053		ECEAOJKS470	ELECTROLYTIC 6.3V 47	2	
C2054		VCUSABH472KB	CERAMIC CHIP 50V 0.0047	1	
C2055		ECEA1EKK010	ELECTROLYTIC 25V 1	1	
		OR ECEA1EKS010	ELECTROLYTIC 25V 1		
C2056		ECQB1H103KH	POLYESTER 50V 0.01	1	
C2057		ECQB1H333KH	POLYESTER 50V 0.033	1	
C2058-2060		ECEA1CKK100	ELECTROLYTIC 16V 10	3	
		OR ECEA1CKS100	ELECTROLYTIC 16V 10		
C2061		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2062		ECEAOJKS470	ELECTROLYTIC 6.3V 47	1	
C2063		VCUSABH102KB	CERAMIC CHIP 50V 0.001	1	
C2064		VCUSABH103KB	CERAMIC CHIP 50V 0.01	1	
C2065		ECEAOJKS470	ELECTROLYTIC 6.3V 47	1	
C2066		ECEA1EKK2R2	ELECTROLYTIC 25V 2.2	1	
		OR ECEA1EKS2R2	ELECTROLYTIC 25V 2.2		
C2067		VCUSABE3332F	CERAMIC CHIP 25V 0.033	1	
		OR	+80%-20%		
		VCUSABH3332F	CERAMIC CHIP 50V 0.033		
			+80%-20%		
C2068		VCYSBDC103MX	CERAMIC 16V 0.01 +-20%	1	
C2069		ECEA1HKS010	ELECTROLYTIC 50V 1	1	
			COILS		
L1001		ELC08D003	50	1	
		OR VLQ0128	50		
L1002		ELC08D002	300	1	
L1003		ELC08D003	50	1	
		OR VLQ0128	50		
L1004		ELC08D002	300	1	
		OR VLQ0129	300		
L1005		ELC08D003	50	1	
		OR VLQ0128	50		
L1006-1009		ELC08D002	300	4	
		OR VLQ0129	300		
			CRYSTAL OSCILLATOR		
X1001		EFOA815K04H4		1	

MC-Service

	Part Name & Description		Pcs / Set	Remarks
	CHIP	1/16W 12K	1	
	CHIP	1/16W 8.2K	1	
	CHIP	1/16W 10K	1	
	CHIP	1/16W 150K	2	
	VARIABLE	10K	1	
	CHIP	1/16W 10K	1	
	CHIP	1/16W 270K	1	
	CHIP	1/16W 27K	1	
	CHIP	1/16W 2.7K	2	
	CHIP	1/16W 22K	1	
	CHIP	1/16W 100K	1	
	CHIP	1/16W 5.6K	1	
	CHIP	1/16W 4.7K	1	
	CHIP	1/16W 56K	1	
	CHIP	1/16W 120K	1	
	CHIP	1/16W 2.2K	1	
	CHIP	1/16W 180	1	
1V	CHIP	1/16W 180		
2	PRECISION METAL FILM	10K +-2%	1	
2	PRECISION METAL FILM	18K +-2%	1	
	CHIP	1/16W 56K	1	
	CHIP	1/16W 82K	1	
	CHIP	1/16W 3.3K	2	
	CHIP	1/16W 10K	1	
2	PRECISION METAL FILM	27K +-2%	1	
	CHIP	1/16W 2.2K	1	
	CHIP	1/16W 120K	1	
	CHIP	1/16W 150K	1	
	CHIP	1/16W 39K	1	
	CHIP	1/16W 150K	1	
	CHIP	1/16W 330K	1	
	CHIP	1/16W 100K	1	
	CHIP	1/16W 120K	1	
	CHIP	1/16W 8.2K	1	
	CHIP	1/16W 56K	1	
	CHIP	1/16W 12K	1	
	CHIP	1/16W 56K	1	
	CHIP	1/16W 150K	1	
	CHIP	1/16W 270K	1	
	CHIP	1/16W 8.2K	1	
	CHIP	1/16W 47K	1	
	CHIP	1/16W 1M	1	
	CHIP	1/16W 180	1	
1V	CHIP	1/16W 180		
	CHIP	1/16W 150K	1	
	CHIP	1/16W 470K	1	
	CHIP	1/16W 68K	1	
	CHIP	1/16W 47K	2	
	CHIP	1/16W 56K	1	
	CHIP	1/16W 5.6K	1	
	CHIP	1/16W 22K	1	
	CHIP	1/16W 150K	1	
	CHIP	1/16W 82K	1	
	CHIP	1/16W 68K	1	
	CHIP	1/16W 10K	1	
	CHIP	1/16W 1M	1	
	CHIP	1/16W 560K	2	
	CHIP	1/16W 120K	1	
	CHIP	1/16W 0	1	
	CHIP	1/16W 27K	1	
	CHIP	1/16W 470K	1	
	CHIP	1/16W 10K	1	
	CHIP	1/16W 330K	1	
	CHIP	1/16W 270K	1	
	CHIP	1/16W 100K	2	
	VARIABLE	100K	1	
	VARIABLE	50K	1	
	VARIABLE	2K	1	
	CHIP	1/16W 100K	2	
	CHIP	1/16W 10K	2	

Ref. No.	Part No.	Part Name & Description		Pcs / Set	Remarks
R2072	ERJ6GCJ104V	CHIP	1/16W 100K	1	
R2073	ERJ6GCJ102V	CHIP	1/16W 1K	1	
R2074	ERJ6GCJ273V	CHIP	1/16W 27K	1	
R2075	ERJ6GCJ333V	CHIP	1/16W 33K	1	
R2076	ERJ6GCJ273V	CHIP	1/16W 27K	1	
R2077	ERJ6GCJ183V	CHIP	1/16W 18K	1	
R2078	ERJ6GCJ561V	CHIP	1/16W 560	1	
R2079	ERDS2TJ563		56K	1	
R2080	ERJ6GCJ274V	CHIP	1/16W 270K	1	
		CAPACITORS			
C1001	ECEA1EKK010	ELECTROLYTIC	25V 1	1	
C1002	VCUSABH820KB	CERAMIC CHIP	50V 82P	1	
C1003,1004	VCUSABH561KB	CERAMIC CHIP	50V 560P	2	
C1005	ECEA1EKK010	ELECTROLYTIC	25V 1	1	
C1006	ECQB1H473JZ	POLYESTER	50V 0.047 +-5%	1	
	OR ECQV1H473KZ	POLYESTER	50V 0.047		
C1007	VCUSABH222KB	CERAMIC CHIP	50V 0.0022	1	
C1008	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C1009-1011	ECEA1EKK010	ELECTROLYTIC	25V 1	3	
C1012	ECEA1AK221Z	ELECTROLYTIC	10V 220	1	
C1013	VCUSABH181KB	CERAMIC CHIP	50V 180P	1	
C1014	VCUSABH101KB	CERAMIC CHIP	50V 100P	1	
C1015	ECEA1AK221Z	ELECTROLYTIC	10V 220	1	
C1016	ECEAOJK221S	ELECTROLYTIC	6.3V 220	1	
C1017	ECEA1AK221Z	ELECTROLYTIC	10V 220	1	
C1018	VCUSABH221KB	CERAMIC CHIP	50V 220P	1	
C1019	VCUSABH472KB	CERAMIC CHIP	50V 0.0047	1	
C1020	ECEA1AK221Z	ELECTROLYTIC	10V 220	1	
C1021	ECEA1CK101X	ELECTROLYTIC	16V 100	1	
C1023-1027	ECEA1CK101X	ELECTROLYTIC	16V 100	5	
C2001	ECQB1H562KH	POLYESTER	50V 0.0056	1	
C2002	ECEA1EKK010	ELECTROLYTIC	25V 1	1	
	OR ECEA1EKS010	ELECTROLYTIC	25V 1		
C2003	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2004	ECQB1H123KH	POLYESTER	50V 0.012	1	
C2005	ECEA1EKK010	ELECTROLYTIC	25V 1	1	
	OR ECEA1EKS010	ELECTROLYTIC	25V 1		
C2006	ECEA1VSN2R2	ELECTROLYTIC	35V 2.2	1	
C2007	ECQB1H223KH	POLYESTER	50V 0.022	1	
C2008	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2009	ECEA1CKS220	ELECTROLYTIC	16V 22	1	
C2010	VCUSABH102KB	CERAMIC CHIP	50V 0.001	1	
C2011,2012	VCUSABH103KB	CERAMIC CHIP	50V 0.01	2	
C2013	VCUSABH272KB	CERAMIC CHIP	50V 0.0027	1	
C2014	ECEA1CKS220	ELECTROLYTIC	16V 22	1	
C2015	ECEA1CKK100	ELECTROLYTIC	16V 10	1	
	OR ECEA1CKS100	ELECTROLYTIC	16V 10		
C2016	ECEAOJK221X	ELECTROLYTIC	6.3V 220	1	
C2017	ECSF16ER27K	TANTALUM	16V 0.27	1	
C2018	ECEAOJK221X	ELECTROLYTIC	6.3V 220	1	
C2020	ECEA1CKK100	ELECTROLYTIC	16V 10	1	
	OR ECEA1CKS100	ELECTROLYTIC	16V 10		
C2021	ECEA1EKKOR1	ELECTROLYTIC	25V 0.1	1	
	OR ECEA1EKSOR1	ELECTROLYTIC	25V 0.1		
C2022	ECEA1EKK2R2	ELECTROLYTIC	25V 2.2	1	
	OR ECEA1EKS2R2	ELECTROLYTIC	25V 2.2		
C2023	ECEA1CKK100	ELECTROLYTIC	16V 10	1	
	OR ECEA1CKS100	ELECTROLYTIC	16V 10		
C2024,2025	ECEAOJKS101	ELECTROLYTIC	6.3V 100	2	
C2026	ECQB1H562KH	POLYESTER	50V 0.0056	1	
C2027	ECEA1EKKOR1	ELECTROLYTIC	25V 0.1	1	
	OR ECEA1EKSOR1	ELECTROLYTIC	25V 0.1		
C2028	ECQB1H562KH	POLYESTER	50V 0.0056	1	
C2029	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2030	ECQV1H104KH	POLYESTER	50V 0.1	1	
C2031	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2032	ECSF16ER27K	TANTALUM	16V 0.27	1	

Ref. No.	Part No.	Part Name & Description		Pcs / Set	Remarks
C2033	VCUSABH102KB	CERAMIC CHIP	50V 0.001	1	
C2034	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2035	ECEAOJKS470	ELECTROLYTIC	6.3V 47	1	
C2036,2037	ECEA1EKK010	ELECTROLYTIC	25V 1	2	
	OR ECEA1EKS010	ELECTROLYTIC	25V 1		
C2038	ECQV1H104KH	POLYESTER	50V 0.1	1	
C2039	ECQB1H223KH	POLYESTER	50V 0.022	1	
C2040	ECEA1EKK010	ELECTROLYTIC	25V 1	1	
	OR ECEA1EKS010	ELECTROLYTIC	25V 1		
C2041	ECEA1EKKOR1	ELECTROLYTIC	25V 0.1	1	
	OR ECEA1EKSOR1	ELECTROLYTIC	25V 0.1		
C2042	ECQB1H332KH	POLYESTER	50V 0.0033	1	
C2043	ECQB1H682KH	POLYESTER	50V 0.0068	1	
C2044	ECQB1H103KH	POLYESTER	50V 0.01	1	
C2045	VCUSABE333ZF	CERAMIC CHIP	25V 0.033	1	
	OR		+80%-20%		
	VCUSABH333ZF	CERAMIC CHIP	50V 0.033		
			+80%-20%		
C2046	ECEA1EKK010	ELECTROLYTIC	25V 1	1	
	OR ECEA1EKS010	ELECTROLYTIC	25V 1		
C2047	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2048	ECEA1CU102	ELECTROLYTIC	16V 1000	1	
C2049	ECQV1H104KH	POLYESTER	50V 0.1	1	
C2050	ECQB1H562KH	POLYESTER	50V 0.0056	1	
C2051	ECQB1H102KH	POLYESTER	50V 0.001	1	
C2052,2053	ECEAOJKS470	ELECTROLYTIC	6.3V 47	2	
C2054	VCUSABH472KB	CERAMIC CHIP	50V 0.0047	1	
C2055	ECEA1EKK010	ELECTROLYTIC	25V 1	1	
	OR ECEA1EKS010	ELECTROLYTIC	25V 1		
C2056	ECQB1H103KH	POLYESTER	50V 0.01	1	
C2057	ECQB1H333KH	POLYESTER	50V 0.033	1	
C2058-2060	ECEA1CKK100	ELECTROLYTIC	16V 10	3	
	OR ECEA1CKS100	ELECTROLYTIC	16V 10		
C2061	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2062	ECEAOJKS470	ELECTROLYTIC	6.3V 47	1	
C2063	VCUSABH102KB	CERAMIC CHIP	50V 0.001	1	
C2064	VCUSABH103KB	CERAMIC CHIP	50V 0.01	1	
C2065	ECEAOJKS470	ELECTROLYTIC	6.3V 47	1	
C2066	ECEA1EKK2R2	ELECTROLYTIC	25V 2.2	1	
	OR ECEA1EKS2R2	ELECTROLYTIC	25V 2.2		
C2067	VCUSABE333ZF	CERAMIC CHIP	25V 0.033	1	
	OR		+80%-20%		
	VCUSABH333ZF	CERAMIC CHIP	50V 0.033		
			+80%-20%		
C2068	VCYSBDC103MX	CERAMIC	16V 0.01 +-20%	1	
C2069	ECEA1HKS010	ELECTROLYTIC	50V 1	1	
		COILS			
L1001	ELC08D003		50	1	
	OR VLQ0128		50		
L1002	ELC08D002		300	1	
L1003	ELC08D003		50	1	
	OR VLQ0128		50		
L1004	ELC08D002		300	1	
	OR VLQ0129		300		
L1005	ELC08D003		50	1	
	OR VLQ0128		50		
L1006-1009	ELC08D002		300	4	
	OR VLQ0129		300		
		CRYSTAL OSCILLATOR			
X1001	EFOA815K04H4			1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		PIN HEADERS		
P24	VJPS0145	18P	1	
P25,26	VJPS0146	20P	2	
P28	VJPS0073	3P	1	
		MISCELLANEOUS		
	T18S	FASTENER	1	
	VMKS0062	PEG PIECE	1	
	VSCS0424	SHIELD CASE	1	
	VJES0006	CHECK TERMINAL	12	

SERVICE CAUTION:
WHEN SERVICING CHIP PARTS,
PLEASE USE THE SOLDERING IRON
LESS THAN 40 WATTS.

★ MARK: 0 OHM RESISTOR
WHEN REPLACING, A 0 OHM RESISTOR
CAN BE SUBSTITUTED BY A WIRE.